Supreme Court, U. S.
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**APPENDIX.**

IN THE

# Supreme Court of the United States

October Term, 1975
Nos. 74-1107, 74-1304

No. 74-1107

FRANCIS LEO CAPPAERT, MARILYN I. CAPPAERT, *et al.*,
*Petitioners,*

*vs.*

UNITED STATES OF AMERICA.

No. 74-1304

STATE OF NEVADA, *ex rel.* ROLAND D. WESTERGARD,
State Engineer,
*Petitioner,*

*vs.*

UNITED STATES OF AMERICA.

**On Writs of Certiorari to the United States Court of Appeals for the Ninth Circuit.**

**Petition for Certiorari in No. 74-1107 Filed March 6, 1975.**
**Petition for Certiorari in No. 74-1304 Filed April 19, 1975.**
**Certiorari in Both Granted June 23, 1975.**

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STATE OF NEVADA, *ex rel.* ROLAND D. WESTERGARD,
State Engineer,
*Petitioner,*

*vs.*

UNITED STATES OF AMERICA.

**On Writs of Certiorari to the United States Court of Appeals for the Ninth Circuit.**

**1. Relevant Docket Entries, U. S. Dist. Ct., D. Nev.**

United States of America v. Francis Leo Cappaert *et al.* Civil LV-1687.

| | |
|---|---|
| Aug. 18, 1971 | Filed complaint and motion for preliminary injunction. |
| Sept. 2, 1971 | Filed stipulation; order continuing hearing |
| Jan. 3, 1972 | Filed stipulation; order setting hearing vacated |
| Apr. 6, 1972 | Filed stipulation; order setting hearing vacated |
| May 2, 1972 | Filed amended complaint and amended motion for preliminary injunction |
| June 28, 1972 | Filed answer to amended complaint |
| June 30, 1972 | Filed motion to intervene as a defendant on behalf of State of Nevada ex rel. Roland D. Westergard, State Engineer |
| July 3, 1972 | Hearing on plaintiff's amended motion for preliminary injunction Ordered that the motion to intervene as a defendant by the State of Nevada is granted |
| July 5, 1972 | Further hearing on plaintiff's amended motion for preliminary injunction |
| Sept. 6, 1972 | Filed motion for plaintiff's agents to have access to defendants' lands |
| Sept. 14, 1972 | Hearing on above motion |



| | |
|---|---|
| Sept. 22, 1972 | Filed stipulation with order thereon, setting forth conditions for plaintiff's access to defendants' lands |
| Apr. 18, 1973 | Plaintiff's motion for a preliminary injunction is granted as prayed for. The Court believes it should appoint a Special Master with authority to impose such limitations upon the pumping from defendants' wells as, in the Special Master's discretion, is deemed necessary to maintain the water level at Devil's Hole high enough to cover the natural shelf and thus tend to insure the survival of the pupfish, and yet at the same time to minimize the injury to defendants' livestock and agricultural pursuits, until final judgment or further order of the Court |
| May 10, 1973 | Filed plaintiff's motion for an order adjudicating defendants in contempt for violation of preliminary injunction |
| | Filed plaintiff's motion to include specific language in Court's order granting a preliminary injunction |
| | Filed plaintiff's motion for T[em porary]. R[estraining]. O[rder]. |
| May 15, 1973 | Hearing on above three motions; first two denied, third motion continued |

| | |
|---|---|
| May 25, June 1, & June 2, 1973 | Further hearing on plaintiff's motion for T.R.O. |
| June 5, 1973 | Filed findings of fact, conclusions of law, and preliminary injunction, plus order appointing Leonard C. Halpenny of Tucson, Arizona, Special Master; preliminary injunction limits defendants' pumping to maintain a mean water level of 3.0 feet in Devil's Hole |
| June 6, 1973 | Filed defendants' notice of appeal<br>Filed defendants' motion for modification of preliminary injunction pending appeal |
| June 19, 1973 | Filed intervenor State of Nevada's notice of appeal |
| June 21, 1973 | Ordered that defendants' motion for modification of preliminary injunction pending appeal be denied |
| June 28, 1973 | Ordered that certain measuring devices be installed under joint supervision of two named individuals representing the parties |
| June 29, 1973 | Filed order of Court of Appeals; ordered that preliminary injunction be stayed pursuant thereto |
| July 23, 1973 | Filed order from Court of Appeals denying stay. This Court declines to modify the preliminary injunction, and stay order filed July 2, 1973, is dissolved |
| Aug. 1, 1973 | Filed defendants' motion for modification of preliminary injunction |



| | |
|---|---|
| Aug. 9, 1973 | Ordered that foregoing motion be denied<br>Ordered that preliminary injunction be modified to cause mean water level at Devil's Hole to rise to 3.0 feet on or before Sept. 27, 1973 |
| Aug. 27, 1973 | Filed mandate from Court of Appeals on its order of Aug. 20, 1973, which is effective immediately as a judgment |
| Sept. 10, 1973 | Filed plaintiff's motion for entry of a permanent injunction |
| Oct. 2, 1973 | Order amending order appointing Special Master in respect of time for submission of monthly reports |
| Feb. 5, 1974 | Ordered that mandate of Court of Appeals remanding action be spread on the minutes |
| Apr. 9, 1974 | Entered findings of fact, conclusions of law, and final decree, plus order continuing appointment of Special Master |
| Apr. 12, 1974 | Filed defendants' notice of appeal |
| Apr. 16, 1974 | Filed defendants' motion for modification of final decree pending appeal |
| Apr. 19, 1974 | Filed stipulation that records in first appeals be part of new record on appeal |
| Apr. 26, 1974 | Filed intervenor State of Nevada's notice of appeal |

| | |
|---|---|
| May 9, 1974 | Ordered that defendants' motion for modification of final decree pending appeal be denied |
| May 13, 1974 | Filed order from Court of Appeals; ordered that decree of District Court be stayed |
| May 31, 1974 | Filed order from Court of Appeals; ordered that, pending appeal, final injunction is modified to require that water level at Devil's Hole be maintained at not less than 3.3 feet below the marker |
| June 7, 1974 | Filed further order from Court of Appeals; entered same order as on May 31 |
| Jan. 21, 1975 | Filed plaintiff's motion to establish a 3.0 feet water level |



## 2. Relevant Docket Entries, C. A. 9.

[Note: There were four appeals in this cause, as follows: (1) The Cappaerts' appeal from the preliminary injunction, numbered 73-2168. (2) Nevada's appeal from the preliminary injunction is 73-2915. (3) The Cappaerts' appeal from the final decree became 74-1690. (4) Nevada's appeal from the final decree was numbered 74-2186.]

### (a) The Cappaerts' Appeal From the Preliminary Injunction, No. 73-2168.

[Caption omitted in printing]

| | |
|---|---|
| June 26, 1973 | Cause docketed |
| June 26, 1973 | Filed appellants' motion for modification of preliminary injunction pending appeal |
| | Order staying preliminary injunction issued by District Court on June 5, 1973, stay to remain in effect for 14 days unless earlier terminated |
| July 17, 1973 | Order declining to modify preliminary injunction pending appeal and dissolving earlier order |
| Aug. 13, 1973 | Filed second motion for modification of preliminary injunction pending appeal |
| Aug. 20, 1973 | Filed *Per curiam* order remanding for proceedings consistent therewith |
| Nov. 9, 1973 | Order consolidating this appeal with No. 73-2915 |

| | |
|---|---|
| Jan. 16, 1974 | Cause argued |
| Jan. 24, 1974 | Order remanding cause to District Court for entry of final decree, after which new appeals will be considered without further briefs or argument |

**(b) Nevada's Appeal From the Preliminary Injunction, No. 73-2195.**

[Caption omitted in printing]

| | |
|---|---|
| Oct. 4, 1973 | Cause docketed |
| Nov. 9, 1973 | Order consolidating this appeal with No. 73-2168 |
| Jan. 16, 1974 | Cause argued |
| Jan. 26, 1974 | Order remanding cause to District Court for entry of final decree, after which new appeals will be considered without further briefs or argument |

**(c) The Cappaerts' Appeal From the Final Decree, No. 74-1690.**

[Caption omitted in printing]

| | |
|---|---|
| Apr. 18, 1974 | Cause docketed |
| May 9, 1974 | Filed appellants' motion for modification of final decree pending appeal |
| May 10, 1974 | Order staying decree of District Court pending further order of this Court |
| May 29, 1974 | Order modifying final injunction so that water level will be maintained at not less than 3.3 feet below marker |



| | |
|---|---|
| Dec. 4, 1974 | Opinion and judgment of affirmance filed and entered |
| Dec. 17, 1974 | Filed appellants' petition for rehearing and suggestion for rehearing en banc |
| Jan. 31, 1975 | Order denying rehearing and rejecting suggestion for rehearing en banc |
| Feb. 7, 1975 | Filed appellants' motion for stay of mandate |
| Feb. 19, 1975 | Order staying mandate on condition that petition for certiorari is filed by Mar. 7, 1975 |
| Mar. 6, 1975 | Advised by Clerk's Office, Supreme Court, that petition for certiorari was filed on Mar. 6, and docketed as No. 74-1107 |
| July 1, 1975 | Filed copy of Supreme Court order granting petition for certiorari |

**(d) Nevada's Appeal From Final Decree, No. 74-2186.**

[Caption omitted in printing]

| | |
|---|---|
| June 21, 1974 | Cause docketed |
| Dec. 4, 1974 | Filed opinion and entered judgment of affirmance |
| Dec. 19, 1974 | Filed petition for rehearing and suggestion for rehearing en banc |
| Jan. 31, 1975 | Order denying petition for rehearing and rejecting suggestion for rehearing en banc |

[Entries from Feb. 7 to July 1, 1975, same as in No. 74-1690, just above, and hence omitted in printing.]

### 3. Amended Complaint.

In the United States District Court, for the District of Nevada.

United States of America, Plaintiff, v. Francis Leo Cappaert, Marilyn I. Cappaert, B. L. Barnett, individuals and Spring Meadows Ranch, Defendants. Civil—LV 1687.

COMPLAINT SEEKING
INJUNCTIVE RELIEF
AMENDED COMPLAINT
(Filed June 2, 1972)

I

This is a civil action in which the United States, as plaintiff, seeks to have the defendants, Francis Leo Cappaert, Marilyn I. Cappaert, B. L. Barnett and Spring Meadows Ranch, enjoined from pumping water from underground sources from Spring Meadows wells No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 1-A and No. 1-B, and all other wells and future wells in Sections 26, 28, 31, 32, 33, 34 and 35, T. 17 S., R. 50 E., Sections 1-4, 9-15 and 24 T., 18 S., R. 50 E., and Sections 5-8, 17-19, T. 18 S., R. 51 E., except for domestic purposes, in order to protect the federal water rights in Devil's Hole, Nevada, a non-contiguous part of Death Valley National Monument.

II

Jurisdiction of the Court is invoked under 28 U.S.C. §1345.

III

Spring Meadows, Inc., was a corporation formed under the laws of the State of Nevada on June 17, 1966, with 60 Court Street, Reno, Nevada, listed as



its place of business. Spring Meadows, Inc. filed a Certificate of Voluntary Dissolution with the Secretary of State for the State of Nevada on December 30, 1970. The only stockholders at the time of the filing of the Certificate of Voluntary Dissolution were Francis Leo Cappaert and Marilyn I. Cappaert of Vicksburg, Mississippi.

IV

Defendant B. L. Barnett is Ranch Manager of Defendant Spring Meadows Ranch, which ranch is located at Lathrop Wells, County of Nye, State of Nevada.

V

Devil's Hole, a 40-acre tract, was withdrawn from the public domain and became part of Death Valley National Monument by Presidential Proclamation 2961, of January 22, 1952. As stated by President Truman in the Proclamation, the area was withdrawn for the preservation of a "remarkable underground pool known as Devil's Hole" and "the presence in this pool of a peculiar race of desert fish . . . which is found nowhere else in the world."

When these lands were withdrawn, the unappropriated waters in, on, and appurtenant to such lands were withdrawn from private appropriation as against the United States and were reserved for use on such lands by the United States to the extent necessary for the requirements and purposes of said reservation.

VI

The United States claims rights in and to the use of as much of the waters of the springs and underground aquifers in, on, and appurtenant to the lands of the Death Valley National Monument at Devil's

Hole, Nevada, as is or may become necessary for the preservation of the pool of water and of the Devil's Hole pupfish (*Cyprinodon diabolis*) therein, having priority dates as of January 22, 1952.

VII

The defendants own lands or claim water rights within the Ash Meadows area near Devil's Hole and claim rights in or to the waters of that area, which rights are adverse to and jeopardize the rights of the United States.

VIII

The defendants drilled wells and began heavy pumping of groundwater in the summer of 1968. Since then they have engaged in heavy pumping each summer and fall. This pumping from wells No. 1-6 has drawn water from the springs and underground sources which comprise the supply for Devil's Hole and has caused the water level in Devil's Hole to drop. The defendants have also drilled two wells in late 1971 or early 1972, wells No. 1-A and 1-B, and have commenced pumping which has drawn water from the springs and underground sources which comprise the supply for Devil's Hole and has caused the water level in Devil's Hole to drop.

IX

On information and belief plaintiff alleges that the only rights of the defendants or any of them to pump water as herein alleged as acquired by Spring Meadows, Inc., a Nevada corporation dissolved voluntarily on December 30, 1970, under Application Nos. 25556, 25557, 25558, 25559, 25561, 25562, 25564, 25571, 25581, 25662, 26427 and 26446, from the State Engineer of the State of Nevada. Because the corporation



filed a certificate of voluntary dissolution with the Secretary of State for the State of Nevada it has thereby abandoned any right it might have had to pump said water. Any further pumping of water is contrary to the laws of the State of Nevada and in derogation of the rights of the United States to waters to maintain the Devil's Hole addition to the Death Valley National Monument.

X

The Devil's Hole pupfish, *Cyprinodon diabolis,* is recognized as an endangered species and is on the list of endangered species of the United States, published by the Secretary of the Interior under the provisions of the Rare and Endangered Species Act, 80 Stat. 926, as amended, 16 U.S.C. 668aa-668cc (1964).

XI

The Devil's Hole pupfish is dependent for feeding and reproduction upon a natural shelf just below the surface of the water in Devil's Hole pool. The pumping of wells 1-6, 1-A and 1-B has lowered the water level of Devil's Hole pool so as to expose seventy percent of the shelf. If the pumping were to continue, the entire shelf would be exposed and the extinction of the Devil's Hole pupfish would result.

XII

Irreparable harm, damage and injury will follow and be done to the plaintiff United States unless pumping of wells No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 1-A and No. 1-B, and all other wells in similar locations is enjoined for the reasons and facts set out in the paragraphs above.

WHEREFORE, plaintiff demands judgment against the defendants as follows:

1. That the Court determine and decree that the plaintiff United States has the rights to the use of so much of the waters from the springs and aquifers as is in, and on, and appurtenant to the land known as Devil's Hole, Death Valley National Monument, as may be necessary for the needs and purposes of maintaining the pool and the desert pupfish population therein, and that such rights be declared to have a priority date of January 22, 1952.

2. That the Court issue a preliminary and permanent injunction enjoining the defendants and each of them from pumping wells No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 1-A and No. 1-B, and from all other diversions and uses of water from springs and aquifers in Sections 26, 28, 31, 32, 33, 34 and 35, T. 17 S., R. 50 E., Sections 1-4, 9-15 and 24 T., 18 S., R. 50 E., and Sections 5-8, 17-19, T. 18 S., R. 51 E., except for domestic purposes, which would be similarly detrimental to the water rights of the United States.

3. That plaintiff be awarded costs and such other relief as the Court may deem proper.

JOSEPH L. WARD
United States Attorney
/s/ Daniel E. Ahlstrom
DANIEL E. AHLSTROM
Assistant United States
Attorney

DONALD W. REDD
JOHN H. GERMERAAD
Attorneys, Department of
Justice
Attorneys for Plaintiff



**4. Answer to Amended Complaint.**

In the United States District Court, for the District of Nevada.

[Caption omitted in printing]

ANSWER TO AMENDED COMPLAINT

FIRST DEFENSE

The Amended Complaint fails to state a claim against the defendants upon which relief can be granted.

SECOND DEFENSE

1. Admit the allegations contained in paragraph I, save and except that defendants deny that plaintiff has any federal water rights in Devil's Hole, Nevada.

2. Admit the allegations contained in paragraphs II, III, IV and X.

3. Deny the allegations contained in paragraph V and allege that said national monument was not created to preserve the desert fish, but only to preserve the underground pool because of its scientific importance.

4. Allege that they are without knowledge or information sufficient to form a belief as to the truth of the allegation contained in paragraphs VI and XI.

5. Answering paragraph VII, defendants deny that portion which reads "which rights are adverse to and jeopardize the rights of the United States" and admit the remainder of the allegations contained in said paragraph.

6. Answering paragraph VIII, admit the drilling of wells by the defendants in 1968 and the pumping of groundwater each summer and fall from 1968, but deny that said pumping was heavy; admit pumping from wells Nos. 1-6 has drawn water from the springs and

underground sources which comprise the common supply of water for defendants and for Devil's Hole and allege that they are without knowledge or information sufficient to form a belief as to the truth of the allegation that such pumping has caused the water level in Devil's Hole to drop; admit that in late 1971 or early 1972, two additional wells were drilled, deny that such wells are numbered 1-A and 1-B, and admit that defendants have caused pumping therefrom and such pumping has drawn water from the springs and underground sources which comprise the common supply of water for the defendants and for Devil's Hole and allege they are without knowledge or information sufficient to form a belief as to the truth of the allegation that such pumping has caused the water level in Devil's Hole to drop. Defendants further allege that wells have been drilled and groundwater pumped by they and their predecessors prior to 1968 from the springs and underground sources which comprise the common supply of water for the defendants and for Devil's Hole.

7. Deny the allegations contained in paragraphs IX and XII.

THIRD DEFENSE

1. On October 14, 1969, the plaintiff granted to Spring Meadows, Inc., predecessor in interest of defendants Francis Leo Cappaert and Marilyn I. Cappaert, a patent to 5,645.33 acres of land in Nye County. Said patent granted to Spring Meadows, Inc., the land "with all the rights, privileges, immunities, and appurtenances, of whatsoever nature, thereunto be-



longing, unto the said claimant, its successors and assigns, forever" excepting and reserving certain enumerated rights, which rights did not include any water rights.

2. Said patent was issued in exchange for other land selected by and deeded to the plaintiff.

3. At the time said patent was issued the plaintiff knew or should have known that Spring Meadows, Inc., intended to use said land for the grazing of cattle and the growing of feed for such cattle.

4. A considerable portion of said land has been used for the grazing of cattle and the growing of feed for such cattle.

5. If the injunction sought is granted, in whole or in part, defendants will be unable to use the land granted by the plaintiff by said patent for any purpose whatsoever.

6. By reason of the foregoing, the plaintiff should be estopped from seeking the injunction prayed for herein.

WHEREFORE, defendants pray that the Amended Complaint be dismissed with costs.

LIONEL SAWYER COLLINS &
WARTMAN
/s/ By Samuel S. Lionel
Samuel S. Lionel
Attorneys for Defendants

(Receipt of copy omitted in printing)

**5. Answer of Intervenor State of Nevada.**

In the United States District Court, for the District of Nevada.

[Caption omitted in printing]

ANSWER OF STATE OF NEVADA EX REL ROLAND D. WESTERGARD, STATE ENGINEER

FIRST DEFENSE

The Amended Complaint fails to state a claim against the Defendant upon which relief can be granted.

SECOND DEFENSE

1. Admit the allegations contained in paragraph I, save and except that defendants deny that plaintiff has any federal water rights in Devil's Hole, Nevada.

2. Admit the allegations contained in paragraph II.

3. Admit the allegations contained in paragraph III except that applicant for intervention is without knowledge or information as to who the stockholders of Spring Meadows were at the time of dissolution and therefore denies the same.

4. Applicant in intervention is without knowledge or information as to the name of the ranch manager of defendants and therefore denies the allegations of paragraph IV.

5. Admit that Devil's Hole, a 40-acre tract, was withdrawn from the public domain and became a part of Death Valley National Monument by Presidential



Proclamation No. 2961 in January 1952 and denies the remainder of the allegations of paragraph V.

6. Applicant in intervention is without knowledge or information sufficient to form a belief as to the truth of the allegations contained in paragraph VI and therefore denies the same.

7. Denies that portion of paragraph VII which reads, "which rights are adverse to and joepardize the rights of the United States" and admits the remainder of the allegations contained in said paragraph.

8. Admit that defendants drilled wells in 1968 but are without information or knowledge sufficient to form a belief as to the truth of the remaining allegations contained in paragraph VIII and therefore denies the same.

9. Admit that the application numbers as set forth in paragraph IX are correct and deny the remainder of the allegations in said paragraph IX.

10. Applicant in intervention is without information and knowledge sufficient to form a belief as to the truth of the allegations set forth in paragraph X and therefore denies the same.

11. Applicant in intervention is without information and knowledge sufficient to form a belief as to the truth of the allegations set forth in paragraph XI and therefore denies the same.

12. Denies the allegations of paragraph XII.

WHEREFORE, Defendant (Applicant In Intervention) prays that Plaintiff be granted no relief under its Complaint herein.

Dated June 29, 1972.

ROBERT LIST
Attorney General
and
L. WILLIAM PAUL
Deputy Attorney General
Attorneys for
Applicant in Intervention
Nye Building, Room 216
201 South Fall Street
Carson City, Nevada 89701

(Affidavit of service omitted in printing)



**6. Transcript of Proceedings, July 3 and 5, 1972.**

In the United States District Court, for the District of Nevada.

(Caption omitted in printing)

Before the Hon. Roger D. Foley, Judge Presiding.

REPORTER'S TRANSCRIPT OF
PROCEEDINGS IN RE HEARING
PLAINTIFF'S AMENDED MOTION FOR
PRELIMINARY INJUNCTION
LAS VEGAS, NEVADA

Monday, July 3, 1972
Wednesday, July 5, 1972

THE CLERK: Civil-LV 1687, United States of America versus Francis Leo Cappaert, et al.

Mr. Daniel E. Ahlstrom and Mr. John H. Germeraad are present as counsel for the Government.

Mr. Samuel S. Lionel and Mr. Roger Wirth are present for the defendants.

Mr. Larry Reynolds and Mr. William Paul are present on behalf of the State of Nevada on a petition to intervene.

Your Honor, this matter is on calendar for hearing plaintiff's amended motion for preliminary injunction.

THE COURT: On June 30 the State of Nevada filed a motion to intervene as a defendant in this matter. [3]

* * *

THE COURT: Your motion will be granted, Mr. Paul. [4]

* * *

WILLIAM W. DUDLEY, JR.,

called as witness in behalf of the plaintiff, being duly sworn, testified as follows:

* * *

DIRECT EXAMINATION

By John H. Germeraad, Esq., of Counsel for Plaintiff:

Q Mr. Dudley, would you also inform the Court of your address, please?

A I live at 6990 West Cedar Avenue, in Lakewood, Colorado.

Q And where are you presently employed, Mr. Dudley?

A I'm employed as a research hydrologist with the U.S. Geological Survey in Denver.

Q Could you give to the Court a sketch of your [6] background, please?

A I received a Bachelor of Science and Engineering in Geological Engineering from Princeton University in 1960, Master of Science in Geology from the University of Illinois in 1962, and a Ph.D. in Geology from the University of Illinois in 1967.

Q (By Mr. Germeraad) During this time did you concentrate on any special areas in your studies?

A Yes. I concentrated in hydrogeology, the study of water resources.

Q Could you go a little further and define for the Court why hydrogeology concerns?

A Well, hydrogeology is the study of the currents and movement of water, predominantly underground water, within the geologic framework of the earth.

Q Dr. Dudley, have you prepared at my request a resume of your occupational experience in geology and hydrogeology since receiving your undergraduate degree in 1960?



A Yes, I have.

Q Do you have a copy?

MR. LIONEL: Your Honor, the defendants will stipulate to the qualifications of Mr. Dudley as a hydrologist. [7]

* * *

Q (By Mr. Germeraad) Dr. Dudley, when did you first begin the study of hydrology in the State of Nevada?

A In the State of Nevada I began doing hydrologic research in 1961.

Q And what percentage of the time since that time has been spent studying hydrology in Nevada?

A Well, overall, from 1961 to the present time, between 50 and 60 percent.

Q And of this how much relates to the Ash Meadows [9] region?

A From September of 1970 through October of 1971, I studied the Ash Meadows region intensely.

THE COURT: From September of '70 until when, Dr.?

THE WITNESS: Until October of 1971.

A (Continuing) I served as Project Chief of the Nevada Test Site hydrology program, in support of the Atomic Energy Commission, and part of my responsibility with regard to that program includes the off-site water resources and their safety, protection from contamination during the testing.

The Ash Meadows region is included within my area of responsibility as Project Chief of that program.

Q (By Mr. Germeraad) On Plaintiff's Exhibit 2, your bibliography, what does the cross designate prior to each of these publications?

A The cross designates those publications that deal with the geology or hydrogeology of Nevada.

Q Does the first publication listed there, "The Effect of Irrigation Pumping on Desert Pupfish Habitats in Ash Meadows, Nye County, Nevada" relate to the specific study of the Ash Meadows region, including Devil's Hole?

A Yes, it does.

Q When did you first start acquiring the data for [10] this report?

A In September of 1970.

Q (By Mr. Germeraad) And what was the objective of this study?

A The objective of the study was to determine whether or not the local pumping, that is, pumping in the Ash Meadows area, was responsible for the observed decline in the water level of Devil's Hole and the decrease in discharge of several springs in the area.

Q Between September '70 and October, 1971, when you collected the majority of the data, what type of data were you collecting and what was your program or methodology in collecting this data?

A Well, we began by diving in Devil's Hole to determine whether the water level had been lowered in the past. We continued to record on a continuous basis the water level in Devil's Hole.

We established several observation wells and recorded the water level in these wells. We recorded the discharge of about ten springs in the area.

THE COURT: Would you explain a little further what you mean by an observation well?

THE WITNESS: Yes, sir. These are wells which do not have pumps and therefore we can install a flip-type recorder down in the casing. [11]



THE COURT: Do you actually drill these wells?

THE WITNESS: No. These are wells that had been drilled by the Spring Meadows Ranch, but not used.

THE COURT: I see.

Q (By Mr. Germeraad) What other activities did you use to gather data for your further studies?

A Well, the last thing that I mentioned was that we did record the discharge of several of the springs. We monitored the pumpage from the well field of the major irrigation wells. We also pump-tested the major wells and well field. We collected water samples and made chemical analyses of them:

Q Is that what you mean by "pump-testing"?

A No, sir. The pump testing is a controlled means of evaluating the well, the well's productive capacity, and the hydrologic characteristics of the rock which is contributing water to the well. We do this by turning on the well and gaining measurements of the water level decline in the water head involvement and follow it hopefully until it stabilizes.

We also measure water levels in nearby wells using these as observation wells during the pump test.

Q Did you make any field examination in addition to the monitoring of the wells and the springs? [12]

A Yes. We made a general hydrogeologic reconnaissance of the area to understand the geologic framework that governs the discharge of water in the Ash Meadows area.

Q (By Mr. Germeraad) Since October of 1971, what has your procedure been regarding the collection of data and your study in the Ash Meadows' region?

A Well, since October of 1971, we have withdrawn many of the observation stations. We have continued to record the discharge of four springs in the area.

Q Could you name those springs for the Court, please?

A Yes. From south to north they are Jack Rabbit Spring—or no, first of all, Big Spring, I'm sorry, then Jack Rabbit Spring, then a small group of springs in the Point of Rocks area, and then finally at the north end of the property, the Fairbanks Spring.

Q Have you also continued to monitor the pumping of other wells?

A We have monitored this by monthly readings of the electrical meters rather than the more intense readings that we took earlier in the program.

Q Could you tell the Court exactly what irrigation wells by their numbers, as of 1971, were being monitored at this time, from beginning in 1970 all the way through [13] to the present date?

A Yes. I have a map which shows the locations of these wells. [14]

* * *

(Plaintiff's Exhibit 2, having been previously marked for identification, is received in evidence at this time.)

A This map shows several features in the Ash Meadows area. First, it shows the major springs. This is Fairbanks Spring, the smaller one, Soda Spring, Rogers Spring, Longstreet—there are a series of smaller springs that altogether discharge fair amounts of water about 170 [14] gallons per minute, right there (indicating), covered by a black dot representing this well. Crystal Spring in this area, is the largest spring in the area. Then there are a series of small springs at the end of this region.



In the Point of Rocks area, which is the prominent limestone hill coming down into Section 7, there is a large spring called the King Pool. There are a series of smaller springs. These are the ones that I referred to earlier as being the small springs in the Point of Rocks area which we had there for sometime.

Then there is Jack Rabbit Spring and finally Big Spring. These are the major springs in the area.

The wells which are used for irrigation, which have rather high yields, are Well 1, Well 2, Well 3, Well 4—this would be until September of 1971—Wells 4, 5 and 6; Well 7, and Well 8. The numbers which I use here are those which prevail in the field during the studies in the summer of 1971.

Q (By Mr. Germeraad) Would you also point out to the Court the location of Devil's Hole; also point out, please, what we have on the map designated as 1A and 1B, and which Mr. Lionel informs me is designated by the Ranch as Wells 16 and 17?

A Yes. All right. Devil's Hole sits right here in the southeastern quarter of Section 36. (Indicating.) [15] The two wells which I was asked to point out are 1A, the open circle with a cross through it, indicating that it is a low-yield well. And I neglected to draw the cross on the legend. It should be on here.

Q (By Mr. Germeraad) And 1B?

A And 1B then is the solid covered-in well in Section 8. Neither of these wells existed during the 1971 yield zone, however.

Q For the record, 1B is known as Well No. 17; is that correct?

A That is correct.

MR. GERMERAAD: Mr. Lionel?

MR. LIONEL: That's what we call it, your Honor.

THE COURT: And 1A as 16?

MR. GERMERAAD: Yes, your Honor.

Q Earlier you said that you monitored the electrical consumption of the pumps on these wells. What was the purpose of this function?

A The purpose of this was to be able to estimate, and on a consistent basis, the discharge of these individual wells in the well field. Initially, we hoped to be able to use discharge meters which were purchased and installed by the Ranch.

However, sediment that was in the water pumped by [16] the wells soon plugged the discharge meters, and all but two are inoperable.

Q (By Mr. Germeraad) So then what was the procedure for the correlation between the water discharge and the electrical consumption?

A The electrical consumption was measured by visiting the wells intensively over a period of at least two days while they were pumping continuously, establishing the rate of use of electrical power. During this period we also then measured the discharge of the wells by means other than meters, such as gauging the open ditches in which the water was discharged.

Q How accurate is this procedure which you have used since the metered wells became inoperable?

A The accuracy is quite good for most of the wells; for some which have varying conditions of lift or back pressure, if they're carrying water to a much higher point than the well, the accuracy is not better than plus or minus 20 percent.

Q As an example, then, if on the basis of your calculations from the electrical consumption you came



up with a figure of 1,000 acre feet, then it could actually vary in actual quantity between 800 and 1,200 acre feet?

A That is correct.

Q But most of the wells have greater accuracy than [17] that?

A Yes. Most have accuracy within 10 percent.

Q (By Mr. Germeraad) Now you can sit down or you can say where you're at.

But now going back to the first information that you mentioned, your examination of Devil's Hole by diving in September of 1970, would you please tell us the methodology of your examination and what you found?

A Above the present water level there are depositional rings, calcium carbonate, that were left by former higher stands of water level. We felt that if these were visible beneath the present water level that they would have indicated that the level had been there in the past, and that the pupfish had been able to survive with that lower water level.

Q Once you referred to this as a bathtub ring. Is this a good concept?

A Yes; very much like a bathtub ring.

Q Then tell us a little bit about your method of examination of Devil's Hole itself under water?

A Well, I personally dove to a depth of about 30 feet, and could see a little beyond that, so I would say that my examination was to a depth of about 40 feet. I had a team of three divers from the National Park Service and whom I instructed by showing them the rings above the present [18] water levels, and what to look for. They went to a depth of 90 feet. None of us observed any features that were similar to those above the present water level, indicating that the water level has been lowered in the past.

Q (By Mr. Germeraad) Are not the rocks in the Devil's Hole area stratified, and could this perhaps mask a lower water level?

A It could, except that the rocks in the Devil's Hole region dip about 40 degrees. They are no longer horizontal as they were when they were originally deposited; consequently, the depositional rings would contrast strongly with the stratification.

Q How long has the United States Geological Survey monitored the water level in Devil's Hole?

A The monitoring began in 1956. It was intermittent and referenced to a marker different than that in use today. This intermittent and reference marker or water level existed up to 1962. In June of 1962 the present reference marker, which consists of a copper washer nailed into a joint on the side of the hole, was established. The record since then is about 90 percent complete, and is consistent with reference to the copper washer marker.

MR. GERMERAAD: Before I go any further, I would like to have the paper copy of this exhibit which is on the screen marked as Plaintiff's Exhibit 3, and admitted [19] into evidence.

* * *

(Plaintiff's Exhibit 3, marked for identification as shown above, is received in evidence.)

Q (By Mr. Germeraad) Do you have another exhibit for us that will show us this water level in Devil's Hole?

A Yes, I have.

MR. GERMERAAD: And this I would like to have marked Plaintiff's Exhibit 4. I would like to have the paper exhibit copy made Plaintiff's Exhibit 4 for identification.



THE CLERK: Plaintiff's Exhibit 4 marked for identification.

(Plaintiff's Exhibit 4, being a diagram, is marked for identification at this time.)

Q (By Mr. Germeraad) Now, could you point out to everyone in the Court the different symbols and everything on this exhibit, and what each thing illustrates?

A Yes. The upper line represents the highest water [20] level that was recorded during any given month in Devil's Hole. The lower line represents the lowest water level reported during a given month in Devil's Hole. The small dots or points, for the record, in existence here are the actual values that were measured during that month. The long dashed lines between them are just dashed points and merely connect the points to show the trend from month to month.

Q (By Mr. Germeraad) Is there a continuous recorder that is in Devil's Hole which gives you the readings so that a person can simply go there once a month and have the complete record?

A This is correct. There is a recorder there. In the period before 1962, I believe you can see it on the paper copy, 1962, this here (pointing), we note that the record is very intermittent. At the time they were not concerned so much with a continuous record of the water level in Devil's Hole as they were in a day-to-day variation, so we do not have a good record back to 1956. We do not also have a reference to the same copper washer.

The interpretation of some of these old charts is very difficult, we think, but this is probably a good approximation of where the water level was.

Q Do you have any doubts as to the height of some of these water levels prior to 1962? [21]

A Prior to 1962 I feel that probably the reference is where the water level is shown somewhat too high.

* * *

Q (By Mr. Germeraad) I'll rephrase the question. I believe earlier you talked about a copper washer. When was this established in Devil's Hole?

A This was established in June of 1962 and July, 1962 readings, and the first that actually used that reference point.

Q Was there a common reference point prior to 1962?

A None that we've been able to identify in examining the historical records.

MR. GERMERAAD: Thank you.

BY THE COURT:

Q What was the relation between that copper washer, the elevation of it, and the water level when installed?

A When installed, sir, the water level was—

Q Was it installed with the existing water level?

A No, sir; it was installed approximately one foot above the water level.

Q The first figure that appears in the upper left-hand corner is .60. As I understand it, that's .60 feet [22] below the washer?

A That is correct.

Q (By the Court) But the washer wasn't installed until 1962?

A That is correct.

Q (By Mr. Germeraad) Continue from 1962 then farther on, please?

A From 1962, which is here (indicating), the water level maintained a rather constant level in the pool until 1968, approximately, when at the end of the year



we began to get a rather large departure, a great drop. In 1969 we got another very large drop. And recovery at the end of 1969 was nowhere near as it had been. It did not get us up to the previous level of the hole.

Then when spring arrived again, the water level began to drop off precipitously again in 1970. And I have another graph which carries that. [23]

* * *

(Plaintiff's Exhibit 4, having been previously marked for identification, is received in evidence.)

MR. GERMERAAD: This next exhibit I would like marked for identification Plaintiff's Exhibit 5.

THE CLERK: Plaintiff's Exhibit 5 marked for identification.

(Plaintiff's Exhibit 5, being a graph, is marked for identification at this time.)

Q (By Mr. Germeraad) Dr. Dudley, how does this relate to the previous exhibit?

A This is a continuation of the monthly lowest water level in Devil's Hole. I have not plotted the highest because there's some problem in scale getting it on to a gauge height notation, and it goes on from 1965 to the present time.

Q Is there shown on this a correlation with pumping of ground water?

A Yes. The pumpage which we have estimated by means of the electrical power readings of the well field, total of the well field, is shown upside down: the line of pumpage increases downward in this corner. (Indicating.)

The first heavy pumping was in 1969. There had been test-pumping in the beginning of irrigation by well

in 1968; from the power records it only recorded back to 1968. [24] With other pumping of wells in 1969, we reached a new record low in Devil's Hole water level.

Q (By Mr. Germeraad) And that is approximately what, Dr. Dudley?

A That was approximately 2.3 feet.

Q And this is below the copper washer?

A This is below the copper washer. Prior to any pumping in the area, the low had been minus 1.59 feet. In 1970, we reached a low of 3.17 feet, I believe it was, and in 1971, again with high pumping, we got down to 3.48 feet.

I do not have the pumpage shown on this graph for 1972 yet. We have not computed it directly. However, we determined on a chart that was collected just a few days ago that we have now reached a level of 3.68 feet as of May 23-June 27.

Q Taking the northeast area in the upper portion of Plaintiff's Exhibit 5, these being the estimated pumpage in acre-feet, what would you get if you added up each of these monthly? Is this both a rate and a total amount?

A This is a total amount pumped per month, which because it is the function at the time is a rate. The actual value pumped per year would be determined by adding each of the points on these. In this case 1971 would work out a little less than 7,000 acre-feet per year. In 1970, [25] it would have very roughly been the same, 6,800; it was considerably less in 1969.

Q (By Mr. Germeraad) Is there some correlation between water pumpage and acres under cultivation?

A Yes, there is. In the December hearings before the State Engineer, in that regard Mr. Barnett, the



Manager of the Spring Meadows Ranch, did state the acreage under cultivation, and nineteen-sixty— [26]

* * *

MR. GERMERAAD: Well, then, Mr. Barnett can also verify this later, and I don't think there's any problem.

THE COURT: All right. I'll receive it subject to a motion to strike later. Go ahead.

MR. GERMERAAD: Thank you, your Honor.

Q Could you give the Court these figures, please?

A Yes. The approximate figures were: in 1967, with 300 acres under cultivation; in 1968, approximately 800 acres under cultivation; in 1969, it went to about 1,750; and this is one of the largest drops, that is when the largest drop started; in 1970, it was about 3,100; in 1971 there was more land cleared; however, it was not all planted. I'm not sure of the exact figures on what acreage was actually under cultivation in 1971.

Q In other words, you don't have the specific knowledge in any way then after 1971?

A That's correct. [27]

Q (By Mr. Germeraad) Okay. Would you say, looking with Plaintiff's Exhibit 5 as an illustration of your testimony, that there is a correlation then between the pumping history and the water level in Devil's Hole?

A Yes. As I cited, there's a very clear correlation between the two.

Q Have you made any attempt to correlate specific wells with the Devil's Hole level?

A Yes, we have.

Q Before we then go on to the next exhibit—

A —data on that.

MR. GERMERAAD: —I'd like Plaintiff's Exhibit 5 admitted into evidence.

* * *

(Plaintiff's Exhibit 5, having been previously marked for identification, is admitted into evidence.)

MR. GERMERAAD: I'd like the paper copy of this marked Plaintiff's Exhibit 6 for identification.

THE CLERK: Plaintiff's Exhibit 6 marked for identification.

(Plaintiff's Exhibit 6, being a graph, is marked for identification at this time.) [28]

Q (By Mr. Germeraad) Could you please explain to the Court what Plaintiff's Exhibit 6 illustrates?

A This exhibit compares the water level in Devil's Hole, in this case the lowest during the month, to the percent of a shallow ledge existing on the edge of Devil's Hole, which is under water at a given water level.

The ledge is considered to be very important for the survival of the pupfish. It was defined as being 100 percent covered in May of 1970—when the water level was at a stage of 2.2 feet. This is approximately six- to eight-tenths of a foot below the normal undisturbed water level in Devil's Hole.

The initial drop in 1969 reduced the coverage to 92 percent at the annual lull; in 1970 only 46 percent of the shelf was covered; in 1971, it dropped to 21 percent; and in early June of 1972, it dropped to 15 percent of coverage, and with the water level, which I reported a few moments ago, of 3.68 which I had added on to the paper copy but not on to this, we are now down to a coverage of about 10 percent of the shelf.

Q These are the low water marks in each case?

A These are the lowest that are recorded each month and each year. [29]

* * *



(Plaintiff's Exhibit 6, having been previously marked for identification, is received into evidence.)

Q (By Mr. Germeraad) Dr. Dudley, do you have another exhibit, going back to my question of correlating specific wells to the water level in Devil's Hole?

A Yes, I do.

MR. GERMERAAD: I'd like the paper copy marked Plaintiff's Exhibit 7.

THE CLERK: Plaintiff's Exhibit 7 marked for identification.

(Plaintiff's Exhibit 7, being a graph, is marked for identification at this time.)

Q (By Mr. Germeraad) Dr. Dudley, would you explain the difference between our paper copy and what you have shown up on the View-Graph?

A Yes. These are made from the identical original illustrations. However, I was not able to get on the View-Graph, which is the contract process "twenty-one scale" both the pumpage and the water levels in Devil's Hole and this observation level, and so I superimposed the lower figure [30] on the paper copy on the hydrographs.

Q (By Mr. Germeraad) Now, could you explain what each of the lines and the bars illustrate, please?

A Yes. The upper black solid line is the mean daily level in Devil's Hole. This is the average water level throughout the day, and computed for each day of the year. And the lower line is the same quantity as the mean daily level in an observation well which is located 900 feet east of Devil's Hole.

All right. Now, the blue histograms give the time during which pumping was going on from the wells which

are numbered as indicated, 1, 2, 3, Well 13, Wells 4, 5, 6, 7 and 8.

Q Could you explain any correlation that you may find between the pumping and the water level of Devil's Hole, please?

A Yes. The hydrograph of the observation well is very useful to look at first, because it responds more sharply to the pumping stresses. Devil's Hole responds somewhat more sluggishly, but this tends to point out the trends that are going on in Devil's Hole.

The pumping essentially started about the end of January or early February in 1971, and we did get a decrease in the water levels of the two. Well 5 ceased pumping in mid-February. We got a recovery of this. The [31] portion of the record through here (indicating) shows the effect of Well 1 pumping being turned off, pumping again, turned off, pumping—but 1 and 4 appear to be affected during that period of time.

The pumping for most of the wells started to get going quite well by early April, and we got a decline in the water levels of each. About, oh, past halfway through April, about April 20, the Ranch encountered labor problems, and most of the wells were shut down for a period of time, and the water levels recovered during this period.

During later May pumping began to pick up again, and we started the decline. By mid-June the pumping was almost continuous for most of the wells in the area, and we had a rather severe decline beginning then.

Now, the second half of this shows the right-hand side of the paper copy—

Q (By Mr. Germeraad) Of Plaintiff's Exhibit No. 7.

A —and we continue then from July with pumping being quite constant for most of the wells in 1, 2,



3—13, 4, 5, 6, 7 and 8, and continued to decline until early September of 1971. On September 9 Wells 4, 5 and 6 were turned off by agreement between the Ranch and Government, and we got a very dramatic recovery in the observation well, followed through usually a little more slowly, however, by Devil's Hole. This recovery, however, was apparently [32] completed, about two-tenths of a foot recovery in Devil's Hole, by mid-October. And we then got a slow decline for the rest of the year, until about December 20, somewhere between the 20th and 25th, this is the period of time when we are no longer collecting data as intensively as we had prior to October, 1971, but between December 20 and December 25, Wells 2 and 3 were turned off. We began to get a recovery at a rate of about two-tenths of a foot per month.

I have one more extension of the Devil's Hole hydrograph here which takes us into 1972.

* * *

(Plaintiff's Exhibit 7, having been previously marked for identification, is received in evidence.)

Q Dr. Dudley, before you take that down—

A Yes, your Honor.

Q —the blue area differs vertically in depth. Would you explain that, please? What is the relation?

A I'm sorry, I forgot to do that. The height of the blue histograms indicates the estimated rate of pumpage of the wells during the time they are on. These are sometimes measured rates and other times they are [33] determined by correlating the electrical power consumption with previous missions.

Q (By Mr. Germeraad) So the thicker the blue bar the more water that is being pumped from that well?

A This is correct. This amount here represents approximately 1,500 gallons per minute in Well 1; Wells 2 and 3 are respectively about 1,000 gallons per minute —about 1,200 gallons per minute from Well 3; not more than 200 from Well 13—this is a rather small well; Well 4 initially had a rather high yield, but during the summer it'd drop off and it was down to a few hundred gallons per minute on the average. The well began to surge and suck air for periods of time. Well—

Q Excuse me, on the bottom of the paper copy, which is marked for identification as Plaintiff's Exhibit 7, there is a scale that shows pumping rate and gallons per minute, and the dashed line shows what its average was for over a period of time; is that correct?

BY THE COURT:

Q If the blue line then were up at the top that would be two thousand?

A Yes, sir.

Q Two thousand what, acre-feet?

A No, gallons per minute.

Q Gallons per minute? [34]

A Right.

Q (By the Court) So this chart is made to scale?

A Yes.

THE COURT: Any objection to the reception of this document?

* * *

THE COURT: It will be received.

Q (By Mr. Germeraad) Do you have another exhibit for us, Dr. Dudley?

A Yes. We have this extended into 1972.

THE CLERK: Plaintiff's Exhibit 8 marked for identification.

(Plaintiff's Exhibit 8, being a diagram, is marked for identification at this time.)



Q (By Mr. Germeraad) Continue, Dr. Dudley.

A In 1972 we had on the observation well initially a greater recovery of about two-tenths of a foot per month in January, in early January. And on about January 20 we began to come down and have the precise date Well No. 1 was turned off and the rate of recovery increased slightly to between three and four-tenths of a foot per month.

The recovery of Devil's Hole, which we were able to record after January 24—we had a missing record in [35] there due to a malfunctioning recorder—the recovery continued until February the, about the 24th, in that range. And then the power records, plus examination of several observation wells, indicate that on February 24 Well No. 1 was turned on and Well No. 2 was turned on. On February 29 Well No. 3 was turned on.

Well No. 1B, or that which is—

Q (By Mr. Germeraad) Known as 17?

A — known as 17, that was turned on on May 5 for production pumping and we had test-pumping before that.

Q Do you have an exact date for that or is this an approximate date for the examination of the observation wells?

A By looking at the observation wells, however, the observation wells in this Point of Rocks area responds very sharply to both Well 1 and Well 1B or Well 17.

Q In period of time, how long of a lag time do you believe exists?

A No more than a few minutes with that particular observation well.

Q Are there any other ways to correlate the specific wells to the water level in Devil's Hole?

A Yes. During the pump testing of the wells throughout, we established the degree of hydraulic connection between the individual wells in the well field and some other observation points. [36]

MR. GERMERAAD: Before we mark our next exhibit for identification, I move the admission of Plaintiff's Exhibit 8.

* * *

(Plaintiff's Exhibit 8, having been previously marked for identification, is rec'd. in evid.)

MR. GERMERAAD: I ask that the paper copy of this exhibit that is now on the View-Graph be marked as Plaintiff's Exhibit 9.

THE CLERK: Plaintiff's Exhibit 9 marked for identification.

(Plaintiff's Exhibit 9, being a diagram, is marked for identification at this time.)

Q (By Mr. Germeraad) What does this exhibit illustrate, Dr. Dudley?

A This exhibit shows the locations of wells south and east of Devil's Hole. Devil's Hole is here. (Indicating.) The observation well which was shown on the previous three hydrographs that I've shown you is right here. (Indicating.) Wells 5, 13, 4, Wells 1, 1A, 1B, 2, 3 and another observation well in Point of Rocks area here—Wells 11 and 12 which are very small yield wells—and [37] in Section 31, Well 31dd—and this well has been used as an observation well since mid-January of 1972.

Q (By Mr. Germeraad) Again, what is marked as 1A and 1B is Wells 16 and 17?

A Respectively; yes.

Q Continue, Dr. Dudley.



A The brown lines on this illustrate the degree of hydraulic connection as determined during the pump testing and in later examination of long-term hydrographs with pumping history of the wells shown.

By a good connection, as shown by the solid line, I mean that we have a response beginning at the observation point very soon after pumping begins, within a few minutes, and that the amount of drawdown at the observation point indicates that there is a complete hydraulic connection between the two.

BY THE COURT:

Q Excuse me, Dr. Dudley. What is the number of the well in the upper—yes, right there?

A That one, sir—that is 31dd.

Q Is that involved in this case?

A Just as an observation well.

Q Okay.

A This is one that does not have a pump in it at the present time, to my knowledge. [38]

Q (By the Court) And your observation well that is 900 feet from Devil's Hole, you designate that as 36dd?

A 36dd. "dd" means, sir, that they are in the, near the extreme southeastern corner of the section.

Q All right. Thank you.

A (Continuing) The "Fair" hydraulic connection just indicates that the response is somewhat more sluggish but still very, very visible at the observation point.

Q (By Mr. Germeraad) In time, could you give us what you're indicating?

A Well, for instance, for pumping Well 1 to 7, and observing at Well 7dd, an observation well, as soon as the pump is turned on here, it would be within two

minutes before the decline would be noticed at 7dd. And that is a "good" connection.

Now, if that well were connected only to a "fair"—with a fair degree of connection, we would expect to see that after perhaps 10 to 15 minutes, instead of a very sharp draw-down, it would round over and begin to drop more slowly

Q While you're at it, could you then define the time then which you have designated as "Moderate" and "Poor"?

A "Moderate" then would probably indicate for wells as far apart as this, that would be perhaps as much as an hour before we saw the draw-down at the observation point [39] in pumping this well, and the amount of draw-down would be less than you would expect for a well that distance from a pumped well.

Q (By Mr. Germeraad) Does the rate of observation of the draw-down also depend upon how much water is being pumped?

A No. The time of arrival of the effect at the observation point is not affected by the amount of the water being pumped. However, this does affect the amount of drawn-down which we will experience at the observation point.

MR. GERMERAAD: Thank you.

One point which I think we probably should have covered in the beginning, your Honor:

Q Can you explain, starting way back with some of our first exhibits, you had a high watermark and a low watermark for a month.

Are there natural forces which cause the water level in Devil's Hole to vary and, if so, please explain these?

A Yes, there are. There are several natural forces which affect the water level in Devil's Hole. First of all,



the tidal forces of the sun and moon produce porosity changes in the atmosphere daily, and we have a fluctuation of the water level resulting from these porosity changes; changes in barometric pressure will also affect the depth to [40] which the water is pushed into the cavern by the air pressure.

BY THE COURT:

Q I understand the latter, but would you explain the porosity changes caused by the moon?

A Yes, sir. The crust of the earth responds on a more limited basis very much as do the oceans to tidal forces.

Q I see.

A And when the moon is fully overhead the crust is lifted somewhat and then is allowed or it's given relief from carrying all this overburden load.

When this happens the force faces dilate slightly and the water level in Devil's Hole and in observation wells then drops somewhat.

Q As the crust of the earth rises then the water level drops?

A Water level drops? Yes.

Q (By Mr. Germeraad) Then in defining the objective of your study, was your study simply just to study the natural variations in the water level, or what?

A Well, it was the objective, of course, to determine whether pumping was causing the unusual declines and indicated that we felt these were unnatural, and wished to determine whether or not pumping was the cause of these [41] declines.

The range in water level of Devil's Hole from natural causes could be as much as a half foot per day. However, these are continually reversing themselves so that

the range from 1962 through 1967 was only a total of seven-tenths of a foot.

Q (By Mr. Germeraad) In other words, the highest high and the lowest low were separated by only seven-tenths of a foot?

A Yes, that's correct. The highest high was .9 feet below and the highest low was 1.59 or 1.6 below the marker.

Q Is the variation on a daily and also cyclical basis then with the tides the reasons you sometimes use averages?

A Yes. This is why we computed the daily means so that we could have an average value compared to the pumping history of the wells. The fluctuation of reverse tides particularly overshadows any of the effects of pumping on a short term basis. That is a matter of a few hours, and it was necessary to use daily means.

Q Now, referring back to Plaintiff's Exhibit 9, just point out briefly the connections and then please explain the significance of this exhibit to us, Dr. Dudley?

A Okay. The degrees of connection, as I indicated [42] a bit earlier are shown in brown. We have an excellent connection in this Point of Rocks area between Wells 1, 3, 7dd. There is also a good connection between Well 1 and Well 1B or Well 17 up to the observation well 31dd. Although these points are separated by a mile and a half—these are sections platted one mile in size—although they are separated by a mile and a half, affects a rise within a matter of perhaps a few tenths of minutes to a few hours at this well here (indicating), and we have had so far two and a half feet of draw-down in this well so far this year. (Indicating.)



This is considerable draw-down for being that far from the wells being pumped.

Well 5—as we discussed on the hydrograph of Devil's Hole and the observation wells, compared that to the pumping history of the well—Well 5 has a "Fair" degree of connection to Well 36dd. It also has a "Fair" connection with Well 13, "Moderate" to Well 4; and generally the connection from Well 4 over toward the Point of Rocks area is not better than "Moderate." It is even "Poorer" between Well 4 and Well 2.

Q Once you finish with this, would you please go to your next exhibit, which also is somewhat of an amplification of this?

MR. GERMERAAD: I'm going to wait to introduce [43] these until both of them are explained.

A This orange overlay—

MR. GERMERAAD: I would like this marked Plaintiff's Exhibit 10 for identification.

THE CLERK: Plaintiff's Exhibit 10 marked for identification.

(Plaintiff's Exhibit 10, being an overlay, is marked for identification at this time.)

Q (By Mr. Germeraad) Go ahead, please.

A —this orange overlay then shows how I infer the connection of wells to Devil's Hole by knowing that Devil's Hole was fairly well connected with this observation well, which is fairly well connected with this, and so forth, on down the line, and we know there's an excellent connection up here in this direction. (Indicating.)

And from this then I believe Well 5 still has the good connection to Devil's Hole, "Good" to "Fair", in that range; that Well 4 has a "Moderate" to "Good" connection; Well 13 has a "Fair" connection. However, it

is a small capacity well. Consequently, the amount of draw-down would not be as great as Well 5.

Well 2 has a "Moderate" to "Poor" connection with Devil's Hole; Well 3 probably a "Moderate" degree of connection; but the two together, you recall, did cause, or when the two together, Wells 2 and 3, were turned off in [44] December of 1971, the decline of Devil's Hole did reverse, and we began to get a recovery for the first time since May of that year.

Well 1 has been a "Fair" degree of connection when it was turned off in January of '72. The recovery was increased. I infer then that Well 1B, since it also affects the same observation points that Well 1 does and affects Well 1 itself, I infer that it also has a "Fair" degree of connection to Devil's Hole.

Q (By Mr. Germeraad) And Well 1B is Well No. 17?

A That is Well No. 17.

Q You have used terms again of "Moderate" and "Poor" and "infer." I believe that these may be scientific terms, and in layman's terms what exactly do you mean? What is the significance then?

A Well, the term "infer" doesn't mean that it's a guess. It means that it's a reasoned way of arriving at this conclusion, although we do not have a means of taking any individual well and pump-testing it with everything else left off and observing Devil's Hole. It has not been economical to leave everything off and pump a well for two weeks.

Q So am I correct then, is what you're saying that because the Ranch was pursuing its normal operation, you could not simply have a chance to observe just one well at [45] each time and how it related to Devil's Hole?



A This is correct, with the entire southern area. We were able to do that with Mr. Barnett's permission in the northern wells, Wells 7 and 8.

Q (By Mr. Germeraad) And are the wells that were drilled in Devil's Hole penetrating the same formation, and also can you define what Devil's Hole is for the Court? I think everybody knows, but for the record explain it, please?

A Well, Devil's Hole, shown as a rectangle here, is a limestone cavern, the roof of which has collapsed, dropping large rocks down into the cavern. As a matter of fact, the shallow shelf, which is gradually being emerged or which is becoming emergent with the lowering of the water level, is actually a kind of a keystone drop rock wedged into the cavern.

It contains a pool which is, oh, 45, 50 feet below the surrounding land surface, and that pool is approximately 40 feet long and about 10 feet wide. The cavern beneath the water level varies some in width from perhaps 12 feet to narrowing down to as much as 3 feet in places, and dips to the southeast at an angle of about 75 degrees. It forms a nearly vertical tabular cavern under the water.

It is an old solution channel. It has been a [46] path for ground water movement from the northeast or the southwest for thousands of years.

BY THE COURT:

Q What do you mean "solution channel"?

A It's a fracture, or in this case, a fault in which the calcium carbonate and the limestone has been dissolved by ground water, creating a dissolved cave or cavern. In this case it's a tabular cavern.

Q And as it goes down the hole it's then vertical?

A Very close to vertical. It stands at an angle of about 75 degrees to horizontal.

Q To what depth?

A Well, to a depth of at least 200 feet. This is the deepest anyone has been, to my knowledge, although there are some that apparently went deeper. They just never came back to tell about it.

MR. GERMERAAD: And this is the reason that it is fenced off, your Honor, for protection.

Q You say this was an old solution that was dissolved by the water and that this became a channel.

Does the water then change that's occupying this pool? Is it a stagnant pool?

A No, this is not a stagnant pool. The water moving through the limestone discharges at various points along the range it fills. If I could put up the map which I think was [47] Exhibit 3 again just briefly—Devil's Hole is here again. (Indicating.) The limestone range or small mountains are outlined by the contour lines in this area. And they are faulted or broken at this area. (Indicating.) And the limestones which normally would be adjacent to them are now deep beneath the surface of the valley. It may have been ruptured by a fault and dropped on the southwest side or alternatively raised on the northeast side.

The general direction of flow of ground water toward Ash Meadows is from the northeast, and where these rocks are fractured and subsequently dissolved we have the paths of greater permeability, one of which is generally through this area. (Indicating) Originally it probably discharged most of its volume from the opening of Devil's Hole itself now that the water level is some 50 feet below the ground surface aquifers, this water then discharged into the valley fill alluvium and the



relative water level from this well into Devil's Hole indicates there's a potential for movement into this valley, and this water is transported to the points of discharge in the rough alluvium.

Q Would it be correct in layman's way of looking at this to look to see that Devil's Hole is like a picture window moving out further then?

A Yes, it is.

Q Okay. You've mentioned alluvium and you've [48] mentioned aquifer. Would you please tell us what these are geologically and how these are related?

A Well, the limestone is what the layman would consider bedrock. It's a hard, well-integrated rock, fractures, forming resistant mountains and things of that sort.

The alluvium, on the other hand, or more properly the valley-filled sediment, some not alluvium in origin, are less consolidated. They consist of sands, gravels, clays, silts, caliche is developed within them, and there are spring travertines which are calcium carbonate deposits left by springs.

Q (By Mr. Germeraad) And the alluvium overlies then the aquifer?

A Yes; right. This overlies the limestone aquifer. The term "aquifer" is really a hydrogeologic term, not a rock unit—well, it's any identified rock unit or portion thereof, such as a faulted zone which will transmit water and yield it to wells.

So that we have basically two sub-systems within a single system. We have the Paleozoic limestone or solution channels and caves transporting water toward the southwest. It runs into the fault which terminates in the hills that's forced to rise until it finds a permeable zone in the valley fill deposit and then continues to the

southwest [49] and returns to discharge water in the Point of Rocks springs—this is Jack Rabbit here. (Indicating.)

Q (By Mr. Germeraad) Would it be correct to say then that a fault is then where blocks of land are offset which then creates many times a sealing barrier which then forces the water up into the alluvium?

A Yes. This is essentially what happened at this point.

* * *

BY THE COURT:

Q Dr., I wonder if you'd be kind enough to define the term "aquifer" again for us?

A Yes, sir. An aquifer is a rock unit or a portion of a rock unit, such as a faulted or broken zone, which transmits water easily enough that it can be produced from wells.

Q Is it a pool?

A No, sir. The water occurs in some types of aquifers, such as sand or gravel just as in the interstices between the grains in the limestone aquifer which transmits water towards the Ash Meadows area. The water occurs by [50] totaling saturating open joints in solution channels.

Q (By the Court) Isn't it a common belief that underground breaks, pools, chasms of some kind were contours that wells were drilled into?

That's not so?

A It is commonly believed, but it is rarely true. And a limestone aquifer of this sort you may encounter as large solution channels which normally are full right to the top. They don't have a free surface until you get to a place like Devil's Hole where you are actually observing the top of the water table.



Q (By Mr. Germeraad) Dr. Dudley, in further perhaps explanation, is there any evidence of what these aquifers may be like in drilling a well, any occurrence during drilling a well, which determines these?

A Yes. From the concussion of the drill bed you can determine the general rock type that you were in, and certain types are more likely to produce water than other types.

A sudden change in the amount of drilling mud which the well accepts, or perhaps some wells would even begin to flow, so that the mud flow is reversed.

Q Does the bit, the drilling bit, ever drop during the drilling of a well?

A Yes. There have been some wells in the Ash Meadows [51] area—Well No. 2 was one of them—in which the bit dropped a matter of a few feet, I believe, two places during the drilling of that well.

The area of Fairbanks Springs and northern Ash Meadows has been test-drilled for clay deposits, and there was one instance where the drill bit dropped several feet also.

MR. GERMERAAD: Your Honor, I'd also like to point out that in Nevada revised Statutes 534.010, "Definitions of Underground Water in Wells" and Chapter, the definition "Aquifer" means a geological formation or structure that transmits water, so there is also a limited legal definition to the extent that this hydrogeological term has been incorporated into the water statutes of the State of Nevada.

THE COURT: Thank you.

Do you have other exhibits?

MR. GERMERAAD: Yes, your Honor. Could we dim the lights once more? We have just a few more.

Q Now, this again is Exhibit 10?

A Right. The relative effects of various wells on Devil's Hole then are that Well 5, while it is pumping, has the greatest affect on Devil's Hole. Well 1 and Well 1B or 17 would have the next greatest affect on Devil's Hole, and the actual interception of flow here is not along this direct [52] radiating line, but rather the southwestward flow towards Devil's Hole is diverted up through or from this valley in which these wells occur, and is brought down this way. (Pointing.)

So that water which normally would discharge in the alluvium in the vicinity of Devil's Hole now is diverted, is brought down the valley, down to the Point of Rocks area to these wells.

Q (By Mr. Germeraad) Continue a little bit about the effect of these other wells, the strengthening affect?

A After Wells 1 and 17, Well 3 on the basis of the recovery in late 1971 and its connection with other wells in the area, and on the basis of the chemistry of its water, probably has the next greatest affect.

Well 2 has been very difficult to separate from Well 3 because of the similarity of their pumping history. However, its chemistry indicates that it probably is only poorly connected to Devil's Hole. The water is of significantly different chemical quality.

Well 13, although it is fairly well connected, is a low-yield well, so that it has a lesser affect than, say, Well 4 or 5, that type. Well 6, which lies to the east or to the west, excuse me, of Devil's Hole, near Crystal Pool, would be rated next.

Then the three wells that are in the north and [53] northwestern area, these are Wells 7, 8 and 10, we at the present time have no evidence with which to link them to the decline of water level in Devil's Hole.

THE COURT: What did you say about 6, Well 6?



THE WITNESS: Well 6 has a "Moderate" affect on Devil's Hole.

Q (By Mr. Germeraad) Dr. Dudley, if I understood you correctly, Wells No. 1, 2, 3 and 17 of course then it was not in existence back in September or August of 1971, you now say have a greater affect on Devil's Hole than Wells 4 and 6, yet in August when we filed the lawsuit, we recommended that at that time we asked the Court for an injunction against Wells 4, 5, and 6. This was later handled by stipulation between the parties.

Why is this, that there seems now to be greater affect in 1, 2, 3, 17 than in Wells 4 and 6 but not Well 5?

A In August when I was asked to recommend the wells that we seemed to have turned on, we had only a part of the hydrograph which I showed you earlier, and this hydrograph was dominated by the affect of Well 5.

Consequently, in addition to the small hydrograph that we had of these shorter periods of records, I also used the chemical similarity of the wells and just their proximity to Devil's Hole as indications of their probable affect on Devil's Hole. [54]

When Wells 4, 5 and 6 were turned off, we were then able to see the affects of Wells 1, 2 and 3.

Q (By Mr. Germeraad) Again, this would be then similar in effect to your earlier pump tests that because all the wells could not be isolated one at a time, sometimes you could not see the relationships until certain other wells were turned off?

A That's correct.

Q You mentioned chemistry, Dr. Dudley. What part does chemistry of the water play in identification of relationships between the wells and Devil's Hole?

A The chemistry—many of the points from which we were able to collect samples are remarkably stable. The range of total dissolved solids is from about 400 to about 475 in the vast majority of the wells and springs.

In some there is a greater degree of dissolved solids. Well 2 has the highest, being about two thousand parts per million; Well 1 has about eight hundred parts per million; Well 3 has about six hundred parts per million.

However, they have all the constituents that are present in the more typical water of Ash Meadows. And Wells 5, 4, 6, plus the major springs, such as Crystal Pool, King Pool, which is right near Well 4—these all have water which is very, very similar to Devil's Hole. The wells which have water which is dissimilar do have all the [55] ingredients. They just have more ingredients in addition.

Q (By Mr. Germeraad) Why would some seem to have more of one chemical or element than another?

A These wells have picked up additional dissolved solids of various types, particularly sulfate and chloride, which is not present to a larger degree in water of Devil's Hole. They have picked these up quite locally, probably right within this valley in here. (Indicating.) And it's here as they approach, as the water approaches these wells.

Q Then am I correct that the water then, depending upon its path through the underground, will pick up then some of the chemicals or elements in the rock that's passing through?

A This is correct. There are evaporite rocks very probably in this basin, and in addition some of the chemicals that have been added to the water may be from infiltration of irrigation water.



Q What does this chemistry, one way or another, tell you? I mean, how does this affect a connection, in layman's terms? We've technically gone through it, but now tell us how this fits into the picture?

A The chemistry of water is consistent with the limestone, the Paleozoic limestone being the source of the water moving through the alluvium through each and every well in the well field. [56]

Q (By Mr. Germeraad) Now, could you tell us, as an overview then, your professional opinion on the relationship of the pumping of these wells to the water level of Devil's Hole?

A I believe the data which has been collected and presented here do indicate a definite cause and effect relationship between the pumping as the cause and the decline of Devil's Hole as the effect.

Q When you show the pathway of the water along the right-hand side of Plaintiff's Exhibit 10—in other words, please correct me if I'm wrong—the water that would normally then flow in the direction of Devil's Hole because of the draw-down, let's say all year round, of Wells 1, 2, 3, 16 and 17 because you're pumping there, the pressure decreases there, and water which normally flows in the direction of Devil's Hole is diverted and brought to the area of Wells 1, 2, 3, 16 and 17 in that fashion?

A That is correct.

Q And then is there a different channel path for wells such as Well No. 5?

A Yes. Wells 4 and 5 are producing water which moves along the eastern boundary or the western boundary of the small range of hills. I can put this on just briefly.

Q And you are now referring to Plaintiff's Exhibit 3? [57]

A This is correct. Wells 4, 5, 13 intercept water which seeps through gravels, to the best of our knowledge, that had been shed from this small range of hills here. (Indicating.) And this would be the direct line of communication and the reason why the observation well here responded so quickly to the shutdown of pumping on September 9, 1971.

The connection between the wells in this small Point of Rocks well field is apparently up to this valley, as I noted earlier, we had two and a half feet of drawdown in the observation well 31dd, and then down through the faulted zone in here. (Indicating.)

* * *

(Plaintiff's Exhibits 9 and 10, previously marked for identification, are received in evidence.)

BY THE COURT:

Q May I ask the question, Doctor, about Exhibit 3: the dotted lines on Exhibit 3, what are their significance?

A Oh. These are the old road networks there.

Q They're simply roads?

A They're simply roads. And they do not coincide [58] in every detail with the records that are presently in the valley.

Q (By the Court.) All right.

MR. GERMERAAD: This is the last View-Graph exhibit. We have one final exhibit which we will not be using on the View-Graph.

THE COURT: Put the lights on, Mr. Bailiff. Exhibits 9 and 10 will be admitted into evidence.

MR. GERMERAAD: Thank you, your Honor.



I have an exhibit that I would like marked Plaintiff's Exhibit 11 for identification.

Unfortunately, I only have one copy of this map. It's up to you, your Honor. Perhaps when Dr. Dudley is explaining it, the attorneys for the defendants can come up, perhaps near your bench, so we all can look at the map.

There are different colors on here which designate different things.

THE COURT: Why don't we have the clerk bring the easel over and put it on there? I think I can see it.

MR. GERMERAAD: Thank you, your Honor.

THE CLERK: Plaintiff's Exhibit 11 marked for identification.

(Plaintiff's Exhibit 11, being a map, is marked for identification at this time.) [59]

Q (By Mr. Germeraad) Dr. Dudley, can you tell us what the different colored zones represent, please?

A Yes. The areas that are colored in red are fee lands owned by Spring Meadows Ranch as determined from the county tax records.

THE COURT: Is that legend explained on the chart?

THE WITNESS: That is written in on there; yes, sir.

A (Continuing) The areas colored in yellow, which are not written in—I could have them if you wish—are Section 15 leases, that is, land which the Ranch leases from the Federal Government. Devil's Home is at the position of this black dot. (Indicating.)

THE COURT: Are the pink or red areas patented mining land?

THE WITNESS: Yes; the red area is patented land.

The area that is uncolored is either federally owned lands which are not leased or else they are patented lands owned by other parties. That includes both categories.

Q (By Mr. Germeraad) Though it's not of a large scale, what else have you also located on this exhibit, Dr. Dudley?

A The wells are plotted here. They're very difficult [60] to see without examining the map closely. But the concentration of wells in the Point of Rocks area that we have discussed mostly, are right in this vicinity. (Indicating.)

BY THE COURT:

Q Do I understand it correctly, the pink or red areas are the defendants' patented properties?

A Yes.

Q Defendants—

A Yes.

Q —in this action. And the yellow is the properties leased to them?

A Yes; that's correct.

MR. GERMERAAD: Your Honor, at this time—I should have done this earlier—there was an error in the amended complaint as to the sections which were mentioned. I've mentioned this earlier this morning to Mr. Lionel, and by having the Court Reporter take down the sections, we can then orally amend the complaint, and I will file papers later formally amending the process, so that in our complaint, in paragraph 1, in the "Wherefore" clauses following paragraph 12, the sections of land which we had requested an injunction against pumping, except for domestic purposes, should read: "A lesser number." And there was one typographical error as well. [61]



These sections are: 17 South 50 East, Sections 28, 33, 34; 17 South 51 East, Section 31 and 32; 18 South 50 East, Sections 2 through 4 and 9 through 15; 18 South 51 East, Sections 5 through 8 and Sections 17 and 18.

MR. LIONEL: May I ask counsel what he's taking out?

MR. GERMERAAD: I have taken out the lands in a given area which are not patented by Spring Meadows; in other words, federally-owned land or land held by other parties not part of this suit, are not covered, and that's why I've made certain deletions.

THE COURT: Well, let's look at paragraph 1 of the amended complaint. Do you have a copy of that in front of you?

MR. GERMERAAD: Yes, your Honor.

THE COURT: Line 30. You say "Sections 25, 28, 31, 32, 33, 34 and 35, Township 17 South Range 50 East"?

MR. GERMERAAD: Right. And I am deleting 26, 31, 32 and 35, leaving line 30 to contain simply Sections 28, 33 and 34.

THE COURT: All right.

MR. GERMERAAD: On line 31, which now reads "Sections 1-4, 9-15 and 24," excuse me, 9 through 15, I am simply deleting Section 1, so that it will now read: "Sections 2 through 4 and 9 through 15." [62]

On the last line—

THE COURT: What about Section 24?

MR. GERMERAAD: Yes; Section 24 is also deleted, your Honor.

THE COURT: That's deleted?

MR. GERMERAAD: Yes, your Honor.

THE COURT: It's amended then, you wish to amend to include Sections 2 through 4 and 9 through 15, inclusive?

MR. GERMERAAD: That's correct, your Honor.

THE COURT: Of Township 18 South Range 50 East? All right.

MR. GERMERAAD: That's correct, your Honor.

On the last line where we have "18 S., R. 51 E.," there is listed Sections 5 through 8 and 17 through 19.

THE COURT: Yes.

MR. GERMERAAD: I am deleting simply Section 19, so it will be 17 and 18, as well as 5 through 8.

Up on the 30th line, where "31" and "32" were deleted, that should have been another line or phrase, and that is "T. 17 S., R. 51 E., Sections 31 and 32."

THE COURT: Now, wait a minute, you're not changing the Township and Range of 28, 33 and 34, are you?

MR. GERMERAAD: No. Those remain the same, your Honor. [63]

THE COURT: And you're adding?

MR. GERMERAAD: I'm adding "17 S. 51 E., Sections 31 and 32." I apologize for the typographical error, the "31" and "32" which I deleted in line 30.

THE COURT: "Township 17 Range 51 East"?

MR. GERMERAAD: Right. And those same numbers then would be carried over to the "Wherefore clause following paragraph 12 of the amended complaint.

THE COURT: Well, I'm wondering—let's see, that appears in the prayer, does it?

MR. GERMERAAD: Yes, your Honor, it does.

THE COURT: And also appears under "Motion for Preliminary Injunction"?

MR. GERMERAAD: That's correct.



THE COURT: Any objection to those amendments, Mr. Lionel?

MR. LIONEL: We have no objection, your Honor.

THE COURT: Mr. Paul?

MR. PAUL: No, your Honor.

THE COURT: Why don't you do this for us? Send to the Clerk and to counsel, with copies to counsel, amended page 1—I guess you have Section 26 there on the last line of page 5—amend pages 5 and 6 then of the amended complaint? Will you do that?

MR. GERMERAAD: Yes, I can, your Honor. [64]

THE COURT: Shortly?

MR. GERMERAAD: I will do it as soon as the secretary upstairs can type it up.

THE COURT: Yes.

Q (By Mr. Germeraad) Now, Dr. Dudley, you have on this Exhibit, Plaintiff's Exhibit 11, two areas outlined. Would you describe the outlined process, please, how these are designated?

A The black line with the hasher mark on it outlined here is the area that was included in the amended complaint before Mr. Germeraad deleted.

MR. GERMERAAD: And that, your Honor, really hasn't changed, except those sections within that outlined area that are not on the—

THE COURT: The boundaries are not changed?

MR. GERMERAAD: —the boundary of that outlined area has not changed; simply the sections that are not owned in fee by Spring Meadows have been deleted.

MR. LIONEL: Is that correct, counsel? Didn't you add Sections 31 and 32 which were not in there?

THE COURT: That's right. Township 17 Range 51 East was added.

MR. GERMERAAD: Yes. That is included on the outlined map.

THE COURT: That's included within the boundaries? [65]

MR. GERMERAAD: That's included within the boundaries on the outlined map, your Honor.

MR. LIONEL: Then you did change the boundaries by extending it—at least that's what you want to do now in the amendment to the amended complaint?

MR. GERMERAAD: That's correct.

Q And would you describe how that section is outlined, Dr. Dudley?

A Yes. That is the largest section here, which is outlined by the dashed black line with the hasher marks on it.

Q Now, is there another—

BY THE COURT:

Q So I may be oriented, counsel, is Range 51 immediately below Range 50? I'm looking at Exhibit 3. Is it east?

A Yes. It would be the township which is immediately east of Range 50.

Q That's what I thought. Well, Devil's Hole is in Section 36?

A That's correct.

Q Is that correct? And that's Township 17 Range 50?

A Yes.

Q Now, we're talking about Sections 31 and 32 of Township 17 Range 51? [66]

A That's correct.

Q (By the Court) Is that on your chart there, on Exhibit 11?



A Yes it is, sir. Those two sections, 31 and 32, of Township 17 South Range 51 East are these section right here, and here. (Indicating.)

Q Oh, yes, I see; yes.

A They're the two sections lying immediately to the east of Devil's Hole.

Q Yes. Devil's Hole is in Section 36. All right. I understand.

Q (By Mr. Germeraad) Now, could you explain the other designated area?

A The line which begins here is a dashed black line, goes north one mile, east— or west, excuse me—two miles, north another two miles, west half a mile, north one mile, west half a mile, and then up to the northern limit of the area—is a line which separates the area in which we have a number of wells, number of pump tests and feel that we have demonstrated clearly the relationship of these wells to the water level in Devil's Hole.

That area lies to the east of this dashed line. To the west of this dashed line we do not have sufficient information because of the lack of wells to observe in this area to state with certainty that the withdrawal of water [67] from this area would have as severe an effect on Devil's Hole as would those that are in the eastern area.

BY THE COURT:

Q I don't understand—this isn't relevant to what you're explaining—but I'd better ask it before I forget it—since Well 6 is almost two sections removed from Devil's Hole to the west, and you described the flow of water from the northeast, how does Well 6 pumping have an impact on Devil's Hole?

A The water which moves through the limestone and then discharges at the edge of the mountains in the vicinity of Devil's Hole moves from there, not only spreading southward, but also spreads westward toward Crystal Pool, slightly north—no, slightly south; Crystal Pool is right here. (Indicating.)

Well 6 is intercepting much of the flow that goes from Devil's Hole normally towards Crystal Pool. Initially, the interception of this water discharging out of the limestone in the vicinity of Devil's Hole, and then discharging finally at Crystal Pool, recently this interception was only a few hundred gallons per minute.

By September of 1971, when Well 6 was turned off by the agreement with the Government, nearly 1,200 gallons per minute of its 1,370 g.p.m. discharge was actually being diverted from Crystal Pool. [68]

Q (By the Court) My question was, how does pumping from Well 6 have an impact on the water level of Devil's Hole, not Crystal Pool?

A By increasing the amount of flow which is required, which the Devil's Hole area is required to deliver by means or in order to satisfy the flow of the spring and to satisfy the demand of the well, the amount of water is increased by means of drawing down Well 6, lowering the pressure of Well 6. This then lowers the pressure backup at the Devil's Hole area.

Q (By Mr. Germeraad) So, correct me if I'm wrong then, the additional amount of water which Well 6 pumped exceeding the flow from Crystal Springs was drawing water maybe through Devil's Hole and somehow then lowering the water level. Am I correct or is this incorrect?

A This is correct.



Q Then would you please conclude by giving us your professional opinion as to the pumping from the wells once more, the sections of land in the smaller designated area, and then the sections of land in the entire enclosed area, and its effect on the water level in Devil's Hole, please?

A Okay. The wells which I have indicated previously have the greatest affect on Devil's Hole and their relationship to this area are Well 5, located at the tip of the pointer here; Well 1 located at the tip of the pointer, [69] Well 1B, then 3 and 2; Well 4 is very difficult to find here—Well 4; Well 6 is located here. (Pointing.)

The wells which we have not been able to tie to the water level fluctuations in Devil's Hole are Well 10, located here (pointing), Well 7, located here (pointing) and Well 8.

Q (By Mr. Germeraad) Wells 7, 8 and 10 then are outside of both designated areas?

A That is correct.

Q And that is the reason that those areas then were not included within the boundaries of the map?

A This is correct. Now, what else did you want? [70]

* * *

Q (By Mr. Germeraad) Would you please in summary form just give us your professional opinion upon the relationship of the irrigation pumping and water level in Devil's Hole, please, as it relates to the map?

* * *

A The more limited area which is east of the line includes the Wells Nos. 1 through 6, 13, 16 and 17; also, our Wells 11 and 12. This is the area that I

feel we have a definite relationship between pumping and the decline of water level in Devil's Hole.

The area lying further to the west, which is included in the complaint, is one in which we will have certainly a lesser effect but we potentially, because of the [71] geological environment, we potentially would have an effect on Devil's Hole also. This line generally follows a linear feature in the topography which I believe is a fault which is actually controlling the location of springs such as Crystal Pool.

For this reason, it is possible that pumping to the west of this fault line would not have as severe an effect as pumping east of the fault line.

MR. GERMERAAD: That concludes Dr. Dudley's testimony, your Honor.

THE COURT: Cross-examination.

## CROSS-EXAMINATION

By Samuel S. Lionel, Esq., of Counsel for Defendants:

Q Dr. Dudley, you've made many trips out to the Ranch, haven't you, during the past two years?

A Yes I have, sir.

Q And you dealt with Mr. Barnett out there, one of the defendants?

A That is correct.

Q And he's the Ranch Manager?

A Right.

Q Has he been very cooperative with the U.S.G.S.?

A Yes. Mr. Barnett has been very courteous and cooperative.

Q And actually has spent money to assist in what was [72] being done out there to make determinations of the effect of these wells on Devil's Hole?

A Yes.



Q (By Mr. Lionel) And in what respect would they expend money?

A Well, the Ranch purchased Parshall flumes to put on the springs and they purchased recorders with which to get continuous records of the stream discharges. They purchased the discharge meters, which unfortunately did not work out because of the substance in the water.

Q All right. Now, all these wells that you talked about, the wells which you indicated would have an effect upon Devil's Hole, are those wells on land which is owned in fee by the defendants, Mr. and Mrs. Cappaert?

A All with the exception of Well No. 13.

Q All except No. 13. Now, let us take some of these wells independently. For instance, supposing that Well No. 1 continued to operate, would that effect the level of the water in Devil's Hole? Let's forget all the other wells.

A If Well No. 1 were operating alone? This is what you're asking?

Q Yes.

A It would affect the water level in Devil's Hole; yes.

Q And it would, in your opinion, if that well, we [73] continued to pump that well only, and did not pump the others, the ledge you're talking about would no longer be submerged after a period of time?

A After a very long period of time—it would take much longer if only Well No. 1 were pumped.

Q (By Mr. Lionel) Well, about how long?

A It's very difficult to say without being able to run a very long term test on Well No. 1 running alone.

Q Supposing only Well 5 was being operated, and none of the other wells, what would its effect have upon the water level in Devil's Hole?

A Apparently on the order of two-tenths of a foot which is the recovery that took place when 4, 5 and 6 were shut down; most of the effect of that was from Well 5.

Q Two-tenths of a foot over what period?

A This would be over the period of a month; on a sustained uninterrupted pumping, this undoubtedly would draw down somewhat more on a gradual basis.

Q How about if we just operated Well 3?

A Its effect would be somewhat less than Well 1 because its discharge is smaller than that of Well 1.

Q But it being operated by itself would over a period of time lower the water level in Devil's Hole; in your opinion?

A It would lower the water level, perhaps not to [74] the bottom of the shelf, if operated alone.

Q (By Mr. Lionel) How about Well 4, what would your testimony be in that case with respect to the water level?

A About the same as Well 3.

Q Now, how do you know these are fee lands, the lands that are marked in red on this—let's see, what is the number?—

MR. GERMERAAD: I believe it's 11.

Q (By Mr. Lionel) (Continuing)—on Exhibit 11?

Dr. Dudley, how do you know that these lands which are red are fee lands?

A The red areas were provided colored on that map by the Bureau of Sports Fisheries and Wildlife who had their real estate section examine the tax rolls as of the date it is written on there, May, 1972; I believe May 3.

Q Do you know how long those lands have been held in fee by the defendants and/or their predecessors? [75]

* * *



A No, I cannot.

Q (By Mr. Lionel) I see. Do you know the background of any of these lands? Are you familiar with the State's selection which occurred in Nevada with respect to those lands during the last century?

A No.

Q Have you ever heard of State selection?

A No, I haven't.

Q I see. Now, this water that comes into Ash Meadows, where does it come from?

A It is collected over a large underground drainage basin, which extends over perhaps forty-five hundred, four thousand five hundred square miles. It extends to the east, to the northeast and to the north; includes the area of the Nevada Test Site and many ranges lying to the east of the Nevada Test Site, ranges and valleys.

Q Some of it actually comes from more than 70 miles away; isn't that correct?

A That's correct.

Q And this basin is about 70 miles, you'd say, in length; and about in area 60 miles wide or more; is that correct?

A That's approximately correct; yes.

Q And this water just flows under the ground, and this limestone formation, and it seeps through the ground; is [76] that correct?

A That is correct.

Q (By Mr. Lionel) And that ultimately it is discharged in certain springs in Ash Meadows?

A That is correct.

Q And it's estimated that the normal spring discharge in Ash Meadows is about 17,000 acre-feet a year?

A That's correct.

Q And it's also estimated that the recharge in that area is about 7,000 acre-feet a year; is that correct?

A I believe that figure to be high myself.

Q You figure it's high?

A I figure that that's too high for recharge directly into the Ash Meadows area; yes.

Q Well, is there considerable literature with respect to that, Dr. Dudley?

A No. There's very little literature with respect to the amount of recharge in the Ash Meadows area; however, arid low areas in the State of Nevada typically receive very little recharge because of the deficiency of soil mositure most of the time.

Q Well, that recharge would come from the mountains, wouldn't it?

A Yes. The recharge which enters the Ash Meadows ground water system is derived primarily from the mountains [77] within the basin.

Q (By Mr. Lionel) These are Spring Mountains, aren't they?

A Yes.

Q So that recharges the water which goes back in under the ground as a result of the precipitation which hits the mountains and then flows into the ground?

A That's right.

Q How much recharge would you think there is in the ground in Ash Meadows?

A How much recharge do I think?

Q Yes; how many acre-foot?

A I would be very surprised if it were more than one thousand.

Q Do you know anyone who has indicated that the recharge in the Ash Meadows area would be as little as one thousand acre-feet a year?



A No.

Q Who are the authorities with respect to the hydrology of the area, which would include the recharging of the ground—recharging?

A Well, the authorities that have studied the Amargosa desert ground water system are Walker and Eakin, published Reconnaissance Report 14.

Q Is that the 1963 report? [78]

A That's the 1963 report.

THE COURT: What's the name of the report?

THE WITNESS: It's Ground Water Reconnaissance of the Amargosa Desert, I believe, or Land and Related Water Resources.

Q (By Mr. Lionel) Done by whom?

A This was done by Walker and Eakin.

Q You're talking about a 1963 Report No. 14?

A Right.

Q Anybody else?

A Yes. There's a report that is currently—actually I believe it has now been released to open file status —U.S. Geological Survey by Winograd, in which he has examined the entire Ash Meadows ground water basin.

Q What year was that?

A Well, it would be 1972; just recently been released.

Q Now, you say this water comes from a long ways away, it comes into Ash Meadows from as far as 70 miles away?

A That's correct.

Q And I believe you indicated, in answer to your Honor's questions there are no underground pools or streams under the water—this is what you call underground water which percolates under the ground? [79]

A That's right.

Q (By Mr. Lionel) Commonly called underground percolating water?

MR. GERMERAAD: Your Honor, I would like to point out at this time in a manner of an objection that the State law of Nevada in their revised statutes has a distinction between percolating waters and aquifers, both of which are under the general category of underground water, and that Dr. Dudley has previously talked about aquifers and their interrelationship with percolating waters.

I would just point this out for the Court because there is perhaps a difference under the law which is important to this case.

THE COURT: While you're talking about that, do you have that statute here?

MR. GERMERAAD: It would be Title 534, your Honor.

MR. LIONEL: Let me have an answer to the question. I assume that was not an objection to the question, your Honor.

MR. GERMERAAD: No. It was just a point, your Honor. I'm sorry.

Q (By Mr. Lionel) Would you want the question read back?

A Yes; if you would, please? [80]

MR. LIONEL: Would you please, Mr. Reporter?

THE COURT: Mr. Germeraad, is it the Government's position here that the definitions spelled out in the Nevada State Water Law are controlling in this case?

MR. GERMERAAD: It's not necessarily controlling, your Honor, but I do think it can help the Court understand the testimony and certainly Dr. Dudley's testimony has been vast as to what the State of Nevada



considers percolating water and aquifers, which is more of a defined area.

Under Nevada State Law, percolating waters are defined as an undetermined pathway or source of water while an aquifer, which Dr. Dudley was testifying about, are definite pathways. And they are treated differently under Nevada law. And that may perhaps have certain significance with the legal arguments of the intervenor, the defendants and the plaintiff, your Honor.

MR. LIONEL: Well, I would submit, your Honor, that would be argumentative.

THE COURT: All right. Thank you.

Please read the question back.

(Last question, found on page 79, lines 22 to 25, and on page 80, lines 1 to 3, was read back to the witness by the Court Reporter.)

A In a hydrologic sense, these would be called underground percolating waters, according to the legal [81] definition which Mr. Germeraad has raised, it would be different.

Q (By Mr. Lionel) Well, we'll let Mr. Germeraad argue that, Doctor.

Now, is this a defined aquifer?

A Which?

Q The aquifer from whence the water comes which is pumped in these wells?

A Okay. You're referring then to the limestone aquifer which underlies the Ash Meadows ground water basin?

Q I'm talking about the aquifer from whence all this water comes, which extends in a northeasterly direction for about 70 miles?

A Yes. It is formally defined by Winograd as a lower carbonate aquifer, and includes limestone and dolomite ranging in age from Cambrian to Devonian.

Q When did Winograd define this?

A In his report recently published.

Q This 1972 report?

A That's correct.

Q Now, prior to 1972, was this considered to be a defined aquifer?

A Yes. It has been considered as the same lower carbonate aquifer by persons and groups which work with the Nevada Test Site in hydrology. Basically, Winograd's work [82] was done in the early middle 1960's, and these terms have been in common use with the Geologic Survey people.

Q (By Mr. Lionel) How long?

A Well, since I became associated with the group in 1965.

Q How long before that; if you know?

A In the published literature, the terms do not appear until about 1967, I believe.

Q Doesn't the question of whether—at least I'm not talking about whatever it may be under Nevada statutes—when you discuss a defined aquifer, you're talking about an aquifer that you know the paths of the water as they come through that aquifer; is that correct?

A Well, you know them generally; yes.

Q Generally. And when is the first time in the literature that you were aware of that there was anything which indicated the paths of the water that flow through the limestone formations and are discharged in Ash Meadows?

A The first that were known to me were the manuscript of Winograd's Report.



Q Which is the new report '72?

A Yes; only I saw the manuscript of it some years ago.

Q I see. Have you read all the literature with respect to the limestone aquifer which discharges water into [83] Ash Meadows?

A I've read a considerable portion of it; yes.

Q (By Mr. Lionel) Have you had all the reported literature?

A No, not all the reported literature.

Q Is there any reason why you haven't?

A Yes; just not enough time to do all the field work, analyze all the data, and prepare my own report.

Q Have you read the interim report of the Inland Basin Projects, Armargosa Project, Nevada and California, done by the United States Department of the Interior, Bureau of Reclamation, dated November, 1968?

A I have examined the report. I've not read it in detail.

Q What was the purpose of that report?

* * *

A The purpose of the Amargosa Project of the Bureau of Reclamation was to examine the feasibility of developing a centralized irrigation water supply through the area, commonly known as the Amargosa Farms.

Q And do you know whether or not the Bureau of [84] Reclamation recommended that there be such a project?

A They recommended that there be a feasibility study.

Q (By Mr. Lionel) To cost seven hundred fifty thousand dollars?

A I believe that's correct.

Q Do you know what happened to that?

A No, I don't know what the present status of it is.

Q You don't know whether the pupfish situation has any relationship to what has happened to that matter, do you?

A I have no direct knowledge of what has happened to it.

Q No direct knowledge.

Now, you indicated that this water which comes into Ash Meadows comes from a great distance away, including the area where the Nevada Test Site is; is that correct?

A That is correct.

Q Now, if the Nevada Test Site was to pump water out of the limestone in that aquifer, and there was substantial pumping, would that pumping affect, after a period of time, the water level in Devil's Hole?

A If there was a—

THE COURT: Pumping from where? I didn't understand your question.

MR. LIONEL: From that Test Site. [85]

THE COURT: Oh, from that Test Site.

A The levels of water at the Nevada Test Site have been monitored so that we are regionally aware of the effect of pumping in that area. It has been very slight. The amount of pumpage from the Test Site has been considerably less than the rate of pumpage in the Ash Meadows area.

Q (By Mr. Lionel) How far away from Devil's Hole is the Nevada Test Site where they're doing the pumping now?

A Well, the southern tip, near the two of Mercury, which is the headquarters, is approximately 20 miles northeast.



Q Is that the general area where they're doing the pumping?

A From there spreading northward into Frenchman and Yucca Basins and some in Paiute Mesa Basin, although the amount there is very small now.

Q And let's assume that there's some portion of the Test Site which is, let's say, about 40 miles from Devil's Hole; is that accurate?

A That is accurate.

Q Now, supposing there were substantial pumping 40 miles away at the Test Site from the limestone aquifer, would that substantial pumping over a period of time affect the level in Devil's Hole?

A Over a period of perhaps decades you would see a [86] small affect; yes.

Q (By Mr. Lionel) As a matter of fact, that same thing would be true if there was pumping any place in this limestone aquifer, even 60 or 70 miles away?

A This is true if you are able to measure the water level accurately enough to go that far, then there would be very, very little effect, but most of the recharge of the basin would be taking place between the center of pumping and point of discharge near Devil's Hole.

Q Let's go to Indian Springs. Do you know how far away from Devil's Hole Indian Springs are?

A Oh, roughly 40 miles.

Q How far, 40 miles? All right. If there were pumping of any substantial size, let's say 2,000 gallons per minute, would that pumping have an effect upon the water level in Devil's Hole, after a period of time?

A It is in a rock formation there which would communicate with the same unit draining to Devil's Hole, and consequently there would be again a very small perhaps indiscernible effect on Devil's Hole.

Q Well, that would really depend upon the amount of pumping and the period of time; isn't that correct?

A This is very true.

Q As a matter of fact, that's true with respect to any pumping which would be done south of Highway 95; isn't [87] that true?

A Yes, except in the direct vicinity of Lathrop Wells, then we get into a different ground water system, which is reasonably well isolated from the Ash Meadows area.

Q (By Mr. Lionel) But what you're saying in effect is, that if there were any substantial pumping in this same ground water system, which is this limestone aquifer, that after a period of time that would effect the level of water in Devil's Hole?

A That is correct.

Q Now, you testified before that this ledge was necessary for the preservation of the pupfish in Devil's Hole; did you say that? I didn't quite recall the precise context.

A Yes, I did say that.

Q Is that within your sphere of expertise?

A No.

Q Or is that because somebody told you that?

A I said that in the sense that I had been told that by those within whose sphere of expertise it is.

Q So you're not saying that? You're saying only because someone told you that?

A Yes. I'm not a biologist.

Q What?

A I'm not a biologist. [88]

Q (By Mr. Lionel) I understand. Who told you that?



A I don't really recall at the moment. I would imagine the first I heard of it is when I met with a committee of people in the Geological Survey to choose a project chief for my study. I would say that I was told of the importance of the ledge at that time.

Q And in effect your studies were done predicated on that basis; is that correct?

A That's correct.

Q And not because of anything that you know with respect to extinction by reason of the fact that the ledge might no longer be under the water?

A This is correct.

Q All right. Now, you say there is considerable evidence that in the past the water level in Devil's Hole has been higher than it now is, and I'm just not talking a few inches—well, let's go back, if I might. The water is approximately 50 feet below the surface in this standpipe hole; isn't that correct?

A That's correct.

Q And you say there's considerable evidence that in the past the water level has been higher, substantially higher, than it presently is; isn't that correct?

A That is also correct. [89]

Q (By Mr. Lionel) And how much higher?

A The depositional rings in Devil's Hole indicate that at least greater than 10 feet and perhaps as much as 17 feet higher. There are other solution features which may be higher core lines which are not terribly visible because of the walls being somewhat unstable. The walls are continually giving way a little bit at a time.

There is a deposit of spring travertine downslope from Devil's Hole, which indicates that Devil's Hole itself probably was a flowing spring.

Q And that the water at one time was up to the top?

A That's correct.

Q And is there any evidence that at any time—well, is it a fair assumption—or is there any evidence to your knowledge that these particular fish were in that Devil's Hole during the period that there was a spring and the water came clean up to the surface?

A I would say that the ancestors of those fish—

Q I beg your pardon?

A The ancestors of the present species undoubtedly were there at that time.

Q Why do you say that?

A Because of the nature of the pupfish in the Ash Meadows area, the other specials could be everywhere there's a [90] drop of water on the surface.

Q (By Mr. Lionel) Well, how do you now they were ancestors? How do you know these were not the same species that are there now in Devil's Hole?

A I do not know that directly.

Q And from what you told me, Doctor, I think it's a fair assumption that this water level was at different heights or different stands over the course of may years between where it now is and the top?

A This is correct.

Q Is there any evidence which you have found which would indicate whether there was something there which would be perhaps the equivalent of this rock ledge that they now use?

A Yes. There are numerous boulders, some flat-topped, erosional shelves, that exist above the present water line, which could have provided the same function to the fish as this ledge at any of the higher levels.



Q What is the function that this ledge now performs for the fish?

A I have no expertise on that, other than what I've heard.

Q And what have you heard?

A I've heard that the function of the ledge is to provide the area in which algae grows and from which then they [91] feed, and it is also their breeding place.

Q (By Mr. Lionel) And you have seen evidence that there were other areas higher up, going up towards the surface, which could have been used for such purposes in years gone by?

A Yes.

Q How about below the level of the water?

A Below the level there is nothing similar until you get to a depth of eighteen and then sloping down to about twenty-three or twenty-four feet.

Q What did you find there at that level?

A There is a small rock fall area which would provide a similar environment except that it does not receive sunlight, and would be on a gravel-type material rather than one uniform rock ledge.

Q Well, except for the sunlight—well, strike that. What's the sunlight for?

A Well, again I'm not a biologist. To my knowledge, the sunlight enhances the growth of the algae on which they feed.

Q Now, at the present time there is in Devil's Hole an artificial shelf; isn't that correct?

A That is correct.

Q For the purpose of taking up, if possible, the function of the shelf if the water level should drop below it? [92]

A That's correct.

Q (By Mr. Lionel) And for the purpose of growing algae on there; is that correct?

A I'm not familiar with all the design criteria for the shelf and the reason for doing it any particular way.

Q When is the last time you've been in Devil's Hole?

A The last time I was in Devil's Hole was in March.

Q Did you observe the artificial shelf?

A Yes.

Q Was there algae on it?

A I don't really know.

Q When was it put in?

A When was it put in? Before I started on the program. I don't really know. It was 1970, sometime.

Q Have you ever seen algae on it?

A I've never examined it to see the algae.

Q Have you ever seen fish on it?

A I've seen them wander by it, occasionally swim over it.

Q Do you know, are there lights above it?

A At the present time I believe there are not.

Q Have you seen lights above it?

A I have.

Q Did you inquire to determine the purpose of those lights? [93]

A It was to provide the equivalent of light that normally the sun would provide on the natural shelf.

MR. GERMERAAD: Your Honor, I'd like to have a standing objection to the breadth of cross-examination that Mr. Lionel is conducting in an area which Dr. Dudley has already said he is not of primary competence, when we will have two witnesses who are experts on the fish testify about their habits and relationship.



I realize that Mr. Lionel is entitled to ask him about his observations, but getting into questions of his opinion, he cannot have an expert's opinion. I think he's going rather far afield, and with your permission I'd like to have a standing objection to the continuance of such questions.

THE COURT: All right. Your objection will be noted.

Q (By Mr. Lionel) Doctor, in your affidavit you stated that there is no evidence preserved on the walls of Devil's Hole that the water level in the cavern has ever been lower than it is at the present time.

Now, why do you say there's no evidence preserved on the walls of Devil's Hole?

A Why do I say that?

Q Yes.

A Because I dove in there and examined it myself, [94] and was unable to find anything that is comparable to the features shown above water level.

Q (By Mr. Lionel) What was the main feature that you were seeking that would have been comparable to what you saw above the water level?

A As I explained earlier, with the so-called bathtub rings, with the deposition of calcium carbonate, in a more or less horizontal plane.

Q Wouldn't those rings, those carbonate rings, be washed away by being submerged under water for a long period of time?

A The water in Devil's Hole is already so high in calcium, magnesium, and the carbonate ions that the dissolution would be a very, very slow process. We have difficulty keeping these ions in solution when we take water samples.

Q Now, are you aware that there were some divers that were in the hole last week; is that correct?

A Yes.

Q And two divers went in, working for the Desert Research Institute of the University of Nevada; is that correct?

A That is correct. That's the way it's been told to me; yes.

Q And also there was a diver that went in [95] representing the Government; is that correct? You've heard that?

A Yes, I've heard that.

Q (By Mr. Lionel) And did you see the reports that were submitted by the two divers who were in for the Desert Research Institute?

A I saw the report about five minutes before Court convened this morning. I have not examined it carefully.

MR. LIONEL: May we have this marked, please?

Q Do you know either of the two people that did this report, Peter J. Mehringer of the Department of Anthropology of Washington State University or C. Vance Haynes of the Department of Geosciences of Southern Methodist University?

A I do not know either named person. I've heard about them both.

THE CLERK: Defendants' Exhibit A marked for identification.

(Defendants' Exhibit A, being a report, is marked for identification at this time.)

Q (By Mr. Lionel) Did you examine the entire report, Doctor?

A I scanned the entire report. I have not read everything carefully. [96]



Q (By Mr. Lionel) Now, in the report the authors talk about this, what they call this Type A carbonate deposits. That's the bathtub ring thing you were talking about; isn't that correct?

A That is correct.

Q And I think you indicated in your direct testimony that if you found any such ring there, that would be pretty strong evidence that there was a lower level in the past?

A That is correct.

Q And you also indicated that if you had one of these rings, it would probably not be associated with anything else because the Devil's Hole is sort of at an angle, isn't that correct, and these bathtub rings run really horizontal?

A Well, what I said is that the stratified rocks are dipping so that there would not be other visual features which would conflict with these.

Q Now, may I perhaps refer you to page 9 of Defendants' A?

MR. GERMERAAD: Excuse me, your Honor, if there is an extra copy, I would certainly appreciate looking at it while he asks some questions.

THE COURT: Yes. Do you have another copy, [97] Mr. Lionel?

Q (By Mr. Lionel) Now, I'd like to start reading from the middle of the page, Doctor: (Reading:)

"We interpret no single feature or combination of features"—

MR. GERMERAAD: Your Honor, I'm going to object to using a document supposedly written by two parties; if those parties are not even here to identify this as their report, there's no connection, and to predicate all these questions on this I think is somewhat

unreasonable, because certainly I am denied any chance to cross-examine the authors, and if we are to use their words as evidence, this is just inadmissible. It's clearly hearsay.

THE COURT: If this were a well-recognized scientific work, and I don't say that it isn't, then, of course, you would cross-examine it from the work itself; otherwise it would have to be received in evidence.

MR. LIONEL: Except this, your Honor. The witness testified that he went down beneath the ground. He has made an affidavit in which he said that there is no evidence preserved on the walls of Devil's Hole.

And I haven't offered this in evidence, your Honor, and I'm using this from the standpoint of cross-examination.

MR. GERMERAAD: Your Honor, if he's simply [98] going to use it as a method of cross-examination, he need not even identify it for the Court. He can simply read it and then come up with a question the substance of which he can ask Dr. Dudley. There's no need for the report.

MR. LIONEL: That's what I'm doing.

THE COURT: If the authors' findings were different from this witness's, it would certainly have evidentiary effect, and I think you should call the authors, or in some other fashion obtain the admission of the report before you cross-examine him.

MR. LIONEL: Well, your Honor, this report was only completed apparently late Friday night, and the authors are not here. They're gone.

But I would like to ask him about certain things in here, your Honor, to test his powers of observation and opinions as an expert.



THE COURT: In effect it would depend somewhat on the weight or effect to be given to the report itself. I don't know what it says. Suppose the report says, "We went down there and we found there was a lower level at such-and-such a distance from the present surface," the only purpose you'd have in that is impeachment: try to convince this Court that there was a lower level.

MR. LIONEL: Well, theoretically, your Honor, I could ask him these questions, and I could bring these [99] people in, and I may have some of that evidence.

THE COURT: Well, you can approach that at the proper time. But the objection will be sustained. You can't examine on this report.

MR. LIONEL: Yes, your Honor.

Well, may I do this, your Honor? May I ask the witness if there was a carbonate deposit similar to those occurring on the walls of Devil's Hole above the water level, would that indicative that the water level of Devil's Hole was a lot lower than it now is?

MR. GERMERAAD: I'm sorry, but could that be re-read for me for my purposes, please?

THE COURT: Yes. Read it back, please, Mr. Reporter.

(Last question read back.)

Q (By Mr. Lionel) Strike the word "lot." Would it indicate that it was lower?

A Well, if this were not only similar but were indeed of the same origin, yes.

Q All right. Now, Doctor, supposing there was a nearly horizontal groove extending for a distance of about seven feet below the surface of the water, and the groove could not be traced on the opposite wall further along the irregular surface, would that be some

indication that the water level in Devil's Hole was lower at some time than it [100] now is?

A One would have to look very carefully at that particular group. It could be a joint; it could be something that had just resulted from rocks falling away—there is, as I mentioned before, a pile of rubble about 18 feet below the present water surface. Some of this would have come from perhaps material dropping from that locality.

Q (By Mr. Lionel) But supposing in addition, Doctor, that there was a shelf with a surface depth which corresponded approximately to the groove which occurred on a portion of a large boulder, might that be some indication that the water level was lower?

A If it were a clearly defined shelf and a depositional shelf; yes.

Q Doctor, do you have any opinion as to whether or not the water level at Devil's Hole was lower than it now is at some time in the past?

A Yes, I do have an opinion. I don't believe that it has been lower.

Q What evidence do you have to support that?

A Because I did not observe nor did three trained divers instructed by me what to look for, nor did they observe any features which were identifiable as being comparable to those above the present water level.

Q In what respect were they trained divers? [101]

A They're from the National Park Service, Lake Mead. They inspect the dam at Lake Mead. They are the types of men then who are excellent at observing features that are, looking for small irregularities in the dam.

They are trained to look under water for people having boating accidents, and things of this sort.



Q (By Mr. Lionel) Were they geologists?

A They were not geologists.

Q Were they hydrologists or geohydrologists?

A No, they were not.

MR. LIONEL: Your Honor, I think I'm going to be able to tie this up with a witness that's here that we have subpoenaed.

Q Now, supposing there was a shelf, Doctor, partly covered by rockfall, which occurred on the northwest wall at the junction of the rockfall in the center of the hole, and there is a rockfall in the center of the hole; isn't there, Doctor?

A Yes, there is a large keystone block in there.

Q And supposing the shelf were exposed for approximately two feet and is approximately a foot wide and is 23 inches below the present water surface, and above this shelf, exposed for only about a foot is another three-inch wide smooth ledge at about 14 inches depth, corresponding in depth to the lower part of the corresponding solution [102] groove which I just mentioned, might that be some indication that the water level was lower?

A Well, I examined that general area, and I did not observe anything that sounds like that description.

Now, if that were so, yes, that would be one possible interpretation of it.

Q (By Mr. Lionel) What would cause a smooth ledge at about 14 inches depth below the water?

A One would have to look at it to determine why it was smooth. Is it smooth because something is deposited on it, or has it been cut off? It's very difficult to tell.

Q But isn't a smooth ledge a pretty good indication that there was water level approximately at the height of that ledge?

A It is a frequent indication that a smooth ledge, on careful examination, is shown to be deposition.

Q Now, did you ever notice any difference in color of the limestone below the water?

A Yes.

Q And where did you notice and observe that?

A Well, there are differences on the hanging wall in some areas, the lower boundary of the color change is rather irregular and it goes along more with the depositional pattern of calcium carbonate that has been deposited from the water. [103]

Q (By Mr. Lionel) But could the difference in color have anything to do with the difference in water level?

A It could have; but not necessarily.

* * *

Q (By Mr. Lionel) Doctor, I'd like to clarify something, if I might. We discussed the recharge in that area. I'm talking really about the desert, that basin, that Ash Meadows area, now, is it correct that it's estimated to be about 7,000 acre-feet per year recharge?

A No. The recharge over that basin, the average annual recharge, probably matches very closely the average annual discharge, which is about 17,000 acre-feet per year.

Q You mean there is a recharge of about 17,000?

A Over the entire area of the Ash Meadows ground water basin, that is, the 4,500 square miles; yes. [104]

Q (By Mr. Lionel) And how much water would really be available in the area here that we're talking about for use? You have about 17,000 feet of spring discharge; is that correct?

A That is correct. And that is essentially the entire discharge of the basin.



Q What would be the perennial yield of that basis, would you say about 34,000 square feet—I mean, 34,000 acre-feet?

A Not without lowering the water level.

Q But would the perennial yield be about 24,000 acre-feet without lowering the water table?

A No, without lowering the water table, it is about 17,000 acre-feet.

THE COURT: Not per year? You said "perennial"?

MR. LIONEL: I'm talking about the perennial yield of water there—and that would be not mining the water; that would be the water.

Q And that, you say, is what appears in that Walker and Eakin report and in that Winograd paper that just recently came out?

A Yes.

BY THE COURT:

Q What is the recharge? [105]

A About 17,000 acre-feet of water per year.

Q (By the Court) I thought you told us one thousand before?

A I understood Mr. Lionel to be speaking only of the Ash Meadows area itself, not of the entire Ash Meadows ground water basin.

Q (By Mr. Lionel) Well, let us perhaps clarify this. There is a certain discharge of water, natural spring discharge, in the Ash Meadows area; is that correct?

A That's correct.

Q And all that discharge is on the land which the defendants own?

A I didn't understand that, sir.

Q Most of those springs are the springs you have discussed before, that you testified concerning?

A That's correct.

Q Now, I'm asking you, without lowering the water table in that area, how much additional water besides the natural spring discharge would be available?

A Without diverting springs? Well, none.

Q But how much would be available for use, say, for farming purposes without lowering the water table in that area?

A For very small withdrawals, there would not be a significant lowering of the water table, such as for domestic use or stock-watering but the withdrawal of a thousand acre-feet [106] or more per year, and there would be a lowering of the water table, as has occurred.

Q (By Mr. Lionel) You mean as a result of this pumping, this has affected the water in Devil's Hole?

A This is correct.

Q But if you would only use the amounts of water which is the perennial yield of a particular area, would that normally lower the water table?

A Over a long range, if you increase the total withdrawal from the basin, you must lower the average water table within that basin. If you withdraw it near the discharge area of the basin, such as the Ash Meadows area proper, then this is where the maximum lowering will occur.

Q So that even though the amount of water which you use is the amount of, say, spring discharge plus the recharge, that would still lower the water table?

A Well, any recharge which does occur locally is accounted for in the spring discharge. This is part of the overall recharge of the basin.



Q Now, Doctor, I'm referring you to the Ground Water Resources Report 14 we discussed before, by Walker and Eakin, which is March, 1963. And, if I may, I'd like to read something in here: (Reading:)

> "The physical conditions in Amargosa today suggest that the estimate of discharge is a better [107] basis on which to estimate perennial yield in the light of better information. Thus, the tentative perennial yield may be about 24,000 acre-feet. Of this about 17,000 acre-feet can be obtained by full development of the springs in Ash Meadows."

Do you agree with that?

A Yes.

Q (By Mr. Lionel) And then do you agree with the following statement: (Continuing reading:)

> "The remaining amount would be available for development by wells largely in the area northwest and northeast of the springs."

A Are you asking me if I agree with that?

Q Yes. Do you agree with that statement in there?

A If a lowering of the water table could be tolerated, yes, that water can be developed.

Q And you say that would cause a lowering of the water table?

A Yes, it would.

Q To what degree? Any place besides in Devil's Hole?

A Yes.

Q Where?

A It would lower the water table in the well, if it were developed to the northwest of the spring line, it would lower the water table there. If it were developed in the [108] northeast, obviously the greater lowering

of the water table would be wherever it was developed to the northeast.

Q (By Mr. Lionel) To what extent would it be developed?

A It would depend on the amount of development of the water.

Q The amount of what?

A The amount of development of water. If we were to develop an additional 7,000 acre-feet, probably it would—well, this is roughly the amount of water that is being developed now. I would say that the overall effect in the basin would be similar to the 7,000 acre-feet which is now developed.

Q Now, what would happen to the water table there except in Devil's Hole, to what extent would it be lowered by the use of that 7,000 acre-feet used by the wells?

A Well, in Devil's Hole it would have been lowered a little over two and a half feet now until the level—

Q Until what?

A Until the level in Devil's Hole—it has already been lowered about two and a half feet and is still dropping—it has not reached a new equilibrium level yet.

Q Where else besides Devil's Hole would the use of that 24,000 acre-feet lower the water table in that basin?

A Wherever you place the center of the pumping. [109]

Q (By Mr. Lionel) I beg your pardon?

A Wherever you place the center of pumping it would lower the water table most at that vicinity, and then at a declining rate it would lower the water table spread away from that area.



Q Would it lower it significantly?

A Seven thousand acre-feet appears to have lowered the water level significantly now.

Q Now, Doctor, Devil's Hole, you indicated, is sort of like a standpipe, isn't it, caused by this fissure?

A Well, in width only it is more like a standpipe along the strike, the direction of propagation of this fall, it is a tabular opening.

Q And what happens down at the bottom?

A No one knows.

Q Well, there were divers down there, and don't you know that there's a great big cavern down there?

A Yes, there are several caverns down there; several rooms.

Q What do you mean by "several rooms"?

A These are places where the fault has been enlarged to a greater degree, period, than the normal passageways, and the enlarged passageways are generally cavern cavities called "rooms".

Q And it's actually like a grotto? [110]

A Yes.

Q (By Mr. Lionel) And actually this water travels in an underground pool for some distance; is that correct?

A Yes.

Q Do you know how far from where Devil's Hole is itself?

A We do not know the limits of Devil's Hole.

Q I see. And into these rooms the water flows and in some cases it fills the rooms and in some cases probably it does not fill the rooms?

A There are probably some rooms that have the roofs above the water table there; yes.

Q That's known as "Brown's Room," one particular room; is that correct?

A Yes.

Q Now, we have some wells which are west of this line here (indicating)?

A That's correct.

Q Now, did you say that pumping there does or does not affect water in Devil's Hole?

A I said I have no evidence at the present time that they do.

Q Is it possible if there was pumping over there, that that pumping over there could very well affect the level of water in Devil's Hole? [111]

A Yes, it could very well.

Q (By Mr. Lionel) As a matter of fact, sometimes it's very difficult to tell whether or not a particular well in that area will affect the level of water in Devil's Hole; isn't that true?

A When other wells are going on and off all the time, yes, it's very difficult to filter out the effect of one particular well.

Q Would a prolonged drought in the area affect the level of Devil's Hole, the level of water in Devil's Hole?

A A regional drought of many decades duration undoubtedly would; yes.

Q Would it have to be of many decades duration?

A The characteristic of ground water movement in a limestone aquifer of this sort is that the area is so extensive that on a year to year variation they're averaged out.

It takes water from such a great distance that the flow tends to remain stable through just the year-to-year climatic variations.



Q And that is the water we're talking about, water which flows these great distances?

A This is correct. And where we have a reliable record of the water level in Devil's Hole, it was, as you saw earlier, amazingly stable. [112]

Q (By Mr. Lionel) Now, this water which you're talking about which flows a great distance is percolating through this limestone formation; is that correct?

A It is moving through the fractures and the enlarged fractures.

Q In what we call an aquifer?

A That's correct.

Q And this aquifer all this great distance is actually a conduit over which this water percolates?

A Well, it's a series of interconnecting conduits, yes, if you wish to put it this way.

Q Actually, this is what we would call a regional flow system?

A That's correct.

Q And if there was any kind of a sizable farming operation any place in that regional flow system, that would have an effect upon the level of the water in Devil's Hole?

A It would have an effect that would be somewhat proportional to the distance of this, the rate of pumping, and if it got a considerable distance away, then the amount of recharge which the basin would pick up between that center of pumping and Devil's Hole would replenish it.

Q I assume you're familiar with the topography and the nature of the land in the general area; is that correct?

A That's correct. [113]

Q (By Mr. Lionel) Now, actually there's an awful lot of land here which is just south of U.S. 95 which would be extremely good for farming, wouldn't it?

* * *

A Well, I'm not an agriculturist. I cannot really evaluate that soil to know whether it's good for farming or not.

Q Well, let's forget the soil for a moment. It's flat land, this area I'm talking to, which is here kind of southwest of U.S. 95?

A Yes, it's reasonably flat land.

Q And with water, to your knowledge, that would be good farming?

A Provided other conditions were suitable; yes.

Q Fine. Now, if there were farming in that area—well strike that. To have farming there, we would have to pump water, otherwise we have no other source, we have no springs; is that correct?

A That's correct.

Q And we'd have to pump that water from the limestone aquifer in this regional flow system which is underneath this ground? [114]

A That is correct.

Q (By Mr. Lionel) And if we did that, and we pump water, would the pumping there in all likelihood have an effect on the level of water in Devil's Hole?

A That is correct also.

Q And when I say "would have an effect," it would reduce the level?

A It would reduce the level; right.

Q Now, actually this hydraulic system, I think was the way you phrased it, the hydraulic qualities of the



ground, really in this aquifer it actually varies, doesn't it, from place to place?

A Yes.

Q In other words, we might have a well one place and we might have another well right near it, and it could be entirely—it's effect, let's say, upon Devil's Hole, or some other place, could be entirely different?

A This is correct.

Q And, as a matter of fact, even if you took the same well at different levels, the transmissibility or the hydraulic effect or quality could very well be different?

A The effect of any one well on Devil's Hole may be the composite of the individual effects moving through separate aquifers into then the limestone system.

Q Well, I'm not talking specifically about how a [115] well may affect it, I'm talking about the fact that in a particular well itself at a definite depth, the hydraulic quality or its effect upon some place would be different perhaps?

A It might or it might not be.

Q (By Mr. Lionel) I see. Now, do you know whether or not over the past years—we're going back many years—the water level in Devil's Hole may have fluctuated widely?

A We have no evidence from the gauging that the Geological Survey has done that it has fluctuated widely within any historic time.

Q I beg your pardon?

A Within any historic time.

Q What do you mean "within historic times"?

A Well, since we have records existing in the historic files in the Survey.

Q Now, if I may refer you to Winograd, which you referred to this morning, and you were talking about his thesis?

A Not his thesis; his open file report on hydrogeological survey. It's entitled, "Hydrology of the Nevada Test Site and Adjacent Area."

Q Are you familiar with Mr. Winograd's "Origin of the Major Springs in the Amargosa Desert of Nevada and Death [116] Valley"?

A That's his thesis.

Q That's his thesis published. Have you seen it?

A I have not yet seen it.

Q You have seen it?

A I have not yet seen it.

Q You have not seen it. Well, would you agree with this statement that appears on page 158 of that thesis which is printed: (Reading:)

> "Although the water level in Devil's Hole has probably been constant for the last 15 and possibly 50 years, several bits of evidence indicate that due to a fluctuated widening in the geologic past that a large spring once emerged from the hole."

Would you agree or disagree?

A No, I'll agree with that.

Q You'll agree. All right. Now, were you at Devil's Hole some time during the month of September of 1971?

A Yes, I was.

Q And was that at a time that Wells 4, 5 and 6 were being pumped?

A Yes. That was just, I believe, about two days prior to their being turned off.



Q And that would be during the early part of September.

A That's correct. [117]

Q (By Mr. Lionel) And do you remember at that time talking to Mr. Barnett, who's the Manager of Spring Meadows?

A I do.

Q And was he at Devil's Hole at that time?

A Yes.

Q And do you remember if Mr. Delbert *Holzman*?

A Yes.

Q You remember him being there?

A Yes.

Q And did you have a conversation with those gentlemen at that time?

A Yes.

Q And they were being cooperative, weren't they?

A Yes.

Q And I think at that time you had taken off the reading in Devil's Hole?

A That's correct.

Q As a matter of fact, at that time you expressed some amazement at the fact that the level of the water as shown by the documentation there was a little higher than was anticipated, than you expected it to be?

A That part of it I don't recall.

Q Do you remember at that time having a conversation and advising or telling Mr. Barnett that you thought that wells could probably be drilled in a certain area over there [118] which would probably not have an effect upon Devil's Hole?

A I told him that I did not have the authority to say where wells could or could not be drilled. I said

that on the basis of the evidence that we had at that time that there was a possibility of developing more water in that area without affecting Devil's Hole.

Now, Mr. Germeraad questioned me about that this morning, and I explained at that time the reasons why we now realize that Wells 1, 2, 3 and 1B do have an effect on Devil's Hole.

Q (By Mr. Lionel) But did you indicate any specific area to Mr. Barnett and Mr. *Holzman* where you thought that wells could be drilled which would not affect the level of the water in Devil's Hole?

A I said at that time, though, wells in the new valley would not have.

Q Wells where?

A In what the ranch people know as the new valley. This is the valley which lies east of Point of Rocks.

Q And that would be where Wells 16 and 17 were dug?

A That is correct.

Q So then in September of 1971, it was your opinion that if wells were dug, or where Wells 16 and 17 have now been dug, that they would not affect the level of the water in Devil's Hole? [119]

A No. My opinion at the time was that we could not identify the effect from Wells 1, 2 and 3.

Q (By Mr. Lionel) But didn't you tell me that if wells were dug in that area, it probably would not affect the water level in Devil's Hole?

A If anyone wanted to know that, they would have to drill one to find out.

Q You didn't tell me that you felt that it probably would not affect the level?



A I felt at that time that it probably would not; otherwise I would have chosen Wells 1, 2 and 3 to have been turned off last September.

Q Then as I understand it correctly at that time, in September, you told Mr. Barnett and Mr. *Holzman* that you didn't think pumping in that area where 16 and 17 had since been drilled or dug, that it would probably not affect the level?

You did tell them that?

A Yes.

Q And it turned out after they drilled it that in fact it did?

A Correct.

Q Now, have you ever checked Well 16?

A Let's see, this is Well—

Q I A? [120]

A —1A? I have looked at it once in the field.

Q (By Mr. Lionel) Did you run any tests on it?

A No.

Q Then you don't know what Well 16 does affect the level in Devil's Hole?

A That's correct.

Q And you're quite certain that 17 in fact does?

A Yes.

* * *

Q Did you yourself do any checking to make a determination as to whether the State of Nevada had granted permits for the digging of these wells and the beneficial use of the water from that source?

A Are you speaking of Wells 16 and 17?

Q I'm talking about all of the wells.

A Yes. I went to the office of the Nevada State Engineer, acquired a copy of his abstract of water

rights in the area, and my primary use of these was to identify the various wells to help locate them.

Q And so then you found out that there were valid [121] permits which had been issued by the State Engineer?

MR. GERMERAAD: I object, your Honor. He's now asking the witness for a legal conclusion about the validity of that.

THE COURT: Sustained. The word "valid." is a conclusion.

MR. LIONEL: I beg pardon?

THE COURT: The word "valid." is a conclusion.

Q (By Mr. Lionel) But it had been issued?

A Yes.

Q And the amount of pumping that was done by the defendants at each of these wells was authorized by those permits?

A The amount of pumping that was done during 1971 was within authorized limits.

Q Do you have any knowledge with respect to '72?

A No, I don't.

Q Then as far as you know, that any pumping done from those wells was within limits authorized by the State Engineer of Nevada?

A As far as I know.

MR. LIONEL: I have nothing further, your Honor.

THE COURT: Mr. Paul, any questions?

MR. PAUL: No, your Honor.

MR. GERMERAAD: I would just have a very few [122] questions, your Honor.

THE COURT: Redirect.



## REDIRECT EXAMINATION

BY MR. GERMERAAD:

Q Dr. Dudley, I think there's been some slight confusion over the amount of recharge in what we call perhaps the Ash Meadows region, or the area of the discharge, the area of the Spring Meadows Ranch, and the recharge of the entire basin area of the water system.

Could you please distinguish between these two for us, please?

A Yes. The Ash Meadows ground water system is the extensive area in Southern Nevada covering about 4,500 square miles. The recharge to this ground water system is approximately equivalent to the discharge from the ground water system.

The system is in more or less equilibrium being approximately 17,000 acre-feet each year.

Q In other words, if a party were to use, to simply pump the water from the springs as it ran over the top of the spring, they could perhaps have as much as 17,000 acre-feet to use?

A This is correct.

Q Not pumping or drawing it out, but as it came over the top, simply siphoning it off? [123]

A This is correct.

Q (By Mr. Germeraad) Okay. The pumping that has been done on Wells approximately 1 through 8 and recently 17 and 18—or, excuse me, I'm sorry, 16 and 17, then it was your opinion, have these lowered the water table in the area of the Spring Meadows Ranch?

A Yes.

Q You were asked at an early point in cross-examination concerning your underwater investigation of Devil's Hole.

How far down did you personally go as a diver?

A I personally dove to a depth of 30 feet and could see clearly to a depth of approximately 40 feet.

Q And the results of that were what?

A The results were, I saw no features which I felt indicated a lower water level than in the past.

Q The three gentlemen that were there, the other gentlemen divers, were they looking at your direction?

A Yes.

Q At a lower level?

A I instructed them above water as to what to look for, and they did go down and report that they had seen no depositional rings, no erosional ledges, and this sort of thing.

Q Mr. Lionel posed several questions about, theoretical [124] questions about ledges. If there was a smooth ledge present below the water level, would that necessarily mean that the water level had been at a lower level?

A Not necessarily.

Q (By Mr. Germeraad) Could you explain just very briefly why not?

A Well, the ledge might be due to such a thing as a joined surface.

Q Speak up a little louder, please.

A The ledge could be due to a joined surface which was exposed. It could, although it's not very likely, just be the way the rock happened to break. This most likely could be controlled by joints. This would be the most likely explanation, other than either depositional or erosional terrace.



Q Thank you. Just a few minutes ago Mr. Lionel asked you about possible wells out in this outer lying region, and what effect these may have on Devil's Hole. And I believe you said, "Well, it would depend perhaps on the amount and we basically perhaps see what happens."

Now, the wells that were in fact drilled and used, 1 through 8, 16 and 17, do they affect Devil's Hole?

A Yes.

Q We were talking about more or less bathtub rings that showed higher levels of water in earlier years, and Mr. [125] Lionel referred to a few works by other gentlemen that talked about "perhaps the spring over the top," and you said "Yes, that this might have taken place in geologic time."

In terms of years, is geologic time three years, four years? What are you talking about? What do you mean by "geologic time"?

A Well, in the history of this particular area, by "geologic time" we mean thousands of years.

Q (By Mr. Germeraad) So, in other words, perhaps these rings and the surface over these 15, 20 feet or more, this is the change that has taken place over a period of thousands of years?

A Several thousands of years.

Q Right; as opposed to the drop of two and a half to three feet, or whatever has been simply in the two to three year period?

A In the amount of three-year period.

Q How fast is the water level going down in Devil's Hole?

A On an average, it is now going down approximately a foot per year.

Q As a hypothetical continuing the normal growing season and the use of water at Spring Meadows as done in the past, what is your opinion as to when this shelf would be dry or completely exposed? [126]

A I would say it would be exposed probably by the middle of this August.

Q (By Mr. Germeraad) One more question. If all these wells stopped except for domestic purposes, which we have not asked to be discontinued in this area, how long will it take for the water level to just go up to, let's say, 85 percent coverage of the shelf, not another eight-tenths of a foot higher to what it was prior to 1967, but just maybe 85 percent, not 100, but maybe 85 percent coverage?

A I would say between a year and a year and a half.

MR. GERMERAAD: No more questions, your Honor.

THE COURT: Mr. Germeraad, what do you mean by "domestic purposes," when you asked the question here?

MR. GERMERAAD: I believe that domestic purposes means that there are naturally employees out there, if a person lives out there, he's naturally going to have to have water.

THE COURT: How about watering his stock?

MR. GERMERAAD: I believe under the State law, and this is what I'm relying on as a definition, under the State law, stock watering is a separate category of beneficial use; irrigation is another. Domestic purposes would simply be that required to keep a household going.

THE COURT: All right. Thank you. [127]



BY THE COURT:

Q I believe you told us earlier, Doctor, that the source of all waters in this basin or system are from the mountains; is that correct?

A A vast majority of the water comes from the mountains.

Q What mountains?

A The Spring Mountains, as far away as the Sand Springs Range, Pahute Mesa, the Nevada Test Site and perhaps as far as the Sheep Range in the East.

Q The Sheep Range and the Spring Mountain Range. How long would it take water, being drawn into the soil from Spring Mountain Range, to reach the Ash Meadows area and Devil's Hole?

A We do not know the exact rates of ground water movement. We are conducting experiments in this area to try to determine what the natural rate of flow is.

Q A matter of years, though, isn't it?

A Yes; many years. The movement is probably a few tenths of a foot per year.

MR. GERMERAAD: One thing further, your Honor. I overlooked asking for the admission of Plaintiff's Exhibit 11. I would move its admission now.

MR. LIONEL: We have no objection.

THE COURT: It will be received. [128]

(Plaintiff's Exhibit 11, having been previously marked for identification, is received in evidence.)

* * *

ROBERT RUSH MILLER,

(called as a witness by and on behalf of Plaintiff, being first duly sworn, was examined as follows:)

* * *

DIRECT EXAMINATION

By John H. Germeraad, Esq., of Counsel for Plaintiff:

Q Would you also give the Court your address, please, Dr. Miller?

A I live at 1117 Brooks Street, Ann Arbor, Michigan.

Q What is your present position, Dr. Miller?

A At present I am Professor of Zoology and Curator of Fishes at the University of Michigan. [129]

Q (By Mr. Germeraad) Could you briefly outline your educational background for the Court, please?

A I obtained my Bachelor of Arts from the University of California at Berkeley in 1938. I went for my graduate work to the University of Michigan where I obtained a Master of Arts Degree in Zoology, in 1943, and a Doctor of Philosophy Degree at Michigan in 1944.

Q And what field was it you were—

A I was in Zoology also.

Q When did you first start or begin the study of pupfish?

A While I was still an undergraduate student of the University of California, I first visited Ash Meadows in December, 1936.

Q Generally, how many papers have you published concerning, in whole or in part, the pupfish, and when was the first one published?

A The first paper on the pupfish was published in 1942. In 1943 I published two papers on the pupfish, one describing a new species from Death Valley, and the other differentiating the species of the Colorado River Basin from that in Death Valley, and in 1948 my doctoral thesis of 155 pages on the fishes of the Death Valley system was published.



Between 1936 and 1972 I have published a total [130] of 17 papers that deal in part or whole with the pupfish genus.

Q (By Mr. Germeraad) Could you also tell us, if there is a pupfish genus, are there other varieties in this genus other than the Devil's Hole variety?

A Yes. We don't know exactly how many species of pupfishes there are, but there are probably as many as two dozen ranging from northeastern North America to North and South America, through Mexico, and in California and Nevada.

Q When did you first begin the study of the desert hole pupfish specifically?

A My first visit to the desert hole, to the Devil's Hole, was in December, 1936. That was the first time that I saw them. From 1937 to 1942, in connection with my doctoral research on the fishes of the Death Valley region, I made many visits to Ash Meadows, and I do not recall exactly how many times I went down into Devil's Hole, but during the total time that I have been involved in the study of Death Valley pupfishes, I have made at least twenty visits into Devil's Hole.

Q Would it be correct to say then, off and on since 1936, you have been studying these pupfishes and even including specifically the Devil's Hole pupfish?

A That is a correct statement to say that during the last 36 years I have from time to time studied pupfishes of [131] the Death Valley region.

Q (By Mr. Germeraad) Would you please tell us a little bit about the nature of what the pupfish is like? Describe it and its habits.

BY THE COURT:

Q What is a pupfish? Not the technical definition: the word "pupfish". Where did the word "pupfish" come from?

A Where did the word "pupfish" come from? The word "pupfish" was coined by Professor Carl Hubbs in reference to their behavorial pattern. This was about in 1948. And it was taken up by the public and accepted by them.

Q (By Mr. Germeraad) Please tell us now a little bit about what the pupfish is like?

A The Devil's Hole pupfish is unique among the some two dozen species of pupfishes in a number of traits. One most obvious thing is the tiny size. It is mature at less than one inch; therefore, it is a dwarf in species, much smaller than any other known species in the genus. It also lacks pelvic fins, the fins on the abdomen, which is not found consistently in any other species.

The males are non-territorial, by which I mean that they do not set aside and guard definitive territories, as is known for all other species of pupfishes. The life colors of the male are distinctive. It has a reddish, orangeish dosal fin and a white border to the anal fin; and the females [132] lack vertical bars, which is unusual for pupfish. All other species known within the genus have these vertical bars in the female.

Q (By Mr. Germeraad) Could you tell us something about the life cycle of the pupfish from birth to death?

A We know for the Devil's Hole pupfish that its life cycle depends upon the fact that it must spawn in shallow areas around rock rubble, that it depends for its survival upon the production of algae and the associated microorganisms with the algae.



And we also know from recent work that it has an interesting migratory pattern, in that during the peak intensity light periods of the day it moves downward to at least 25 to 40 feet, and then migrates up as the light wanes in the late afternoon, so that the activity cycle is most active in the late afternoon and early morning.

Q Do all pupfish migrate or only certain age pupfish?

A Devil's Hole pupfish is the only one known to do this.

Q Now, do the very young migrate down as low as 40 feet?

A I have seen fish lower than, actually deeper than that level, but the great bulk of the population probably does not live, does not migrate to greater depths than 25 to [133] 40 feet. There have been a few stragglers found down at deeper depths.

Q (By Mr. Germeraad) You mentioned the sunlight as concerning the migration habits. Is the sunlight vital in any other ways?

A The sunlight, and we do not know the precise role because we have not measured the intensity or the quality of the light, but obviously from the development of algae during the year, the sunlight is required for a normal cycle of algal development upon which the population of the pupfish depends. What the pupfish eats, including algae, is associated with the production of algae.

Q Does the sunlight, as it reaches the water surface in Devil's Hole, vary from one time of the year to another?

A Yes, it does. In the late spring and early summer and probably during most of the summer—we do not have the exact figure—but sunlight does fall on

the surface of the breeding place, the breeding ledge, and over perhaps half of the rest of the pool anywhere from two to three and a half hours a day.

And in the wintertime there is no sunlight falling on the surface in Devil's Hole, and algal production drops to an insignificant amount, especially after November and December. In December and January there's practically no algal production whatsoever. [134].

Q (By Mr. Germeraad) Would the population in numbers of Devil's Hole pupfish vary through the years as well?

A Yes. In the mid-winter the population is at its lowest ebb in correlation with the virtual absence of algae. And beginning in the spring, the population starts to build up and is high in the spring. And there's another peak in late summer, and it drops off again to the winter low.

Q During the past 30 years or so, have you conducted counts of the fish?

A We have attempted to estimate the population size over a long span of time. The first time that I attempted to estimate the population was in December of 1936. And some of these early estimates were made without any knowledge that we were not seeing the entire population of fish; for many years it was thought that one could simply stand at Devil's Hole, look down the artificial shelf and for a few feet below that level count all the fish, but when we discovered they migrated to greater depths, we realized that some of these early counts were low.

Q Doctor, you said "looked down the artificial shelf." Is that what you meant to say?



A I'm sorry; the natural shelf. There is no artificial shelf in the early days. [135]

We used various methods of counting. In the early days, we simply stand near or on the natural shelf and count the numbers of fish we could see swimming over the natural shelf. We would make several estimates and average the estimates to get some appreciation of the number of fish.

In later years, much later, we employed underwater diving gear, and we also used a face mask and snorkel so that we were able to get down below the surface and see particularly the newborn young fish, which are extremely difficult to observe above the water surface. And when we used divers, we were able to gain some appreciation of the population movement.

Q (By Mr. Germeraad) Can you tell us something generally: What do you believe the stable—prior to the drop in the water level in Devil's Hole, starting maybe in 1969, prior to that time, what is your opinion as to the population at the different times of the year?

A The first attempt to get an objective count of the fish in Devil's Hole was made by me on April 1, 1950, when I actually used a seine, small fine-mesh seine, and tried to seine all of the fish off of the natural shelf, put them in a one-gallon tank, count them, and return them to the water.

At that time I caught 127 fish, but the adjusted estimate of the population at that time, knowing what we do [136] now about the movement of fish to greater depths, would be approximately two hundred or slightly in excess of two hundred fish.

Q (By Mr. Germeraad) Based on counts further in 1969, what would be the maximum population at the high peaks in the summer?

A From June 30 to July 1, 1967, a number of us spent a long period of time attempting to remove all of the fish from the artificial shelf or from the natural shelf of Devil's Hole. And over that period in which we operated night and day continuously we removed by actual count 464 fish. This was the last day of June and the first day of July.

Q And this was collected just from the upper regions?

A This is from the natural shelf. It did not include any fish at greater depths. So our estimate then was that the population at that time was probably close to 700 individuals. This is the highest estimate that has been made for Devil's Hole.

So that the mid-winter population number probably runs around two hundred normally, and the maximum production in the summertime would be around seven hundred.

Q Now, since the pumping began, have you made various counts since 1969?

A In 1970, on November 18, following one of the [137] meetings of the symposium on pupfishes in Death Valley National Monument, I went over to Devil's Hole, and using a face mask, estimated that there were close to 800 fish in Devil's Hole. Now, this is an unusually high number, and the explanation for it is that the artificial shelf, an artificial shelf had been installed in Devil's Hole on May 12, 1970, and thinking that algae production would be enhanced by adding artificial lights over this shelf, on September 17 a series of artificial lights were added to enhance the growth of algae.

What I believe happened is that the algal production was extended beyond its normal duration, and the



fish that I saw were mostly old adults, which would normally have died but were able to survive until as late as November 18 by having this extra supply of food, because I understand that within a month after I got this estimate of 800 fish, there was a dramatic decrease in the number of fish in Devil's Hole.

* * *

Q (By Mr. Germeraad) Who was it that told you this?

A The National Park Service: Pete Sanchez' report.

Q Okay. We'll just go on. Have you made other [138] counts since November '70?

A On June 29, 1971, I visited Devil's Hole and counted about 90 fish on the natural shelf. At that time the shelf was about 70 percent exposed. My adjusted estimate for the total number of population at that time was between two hundred and three hundred fish.

Q (By Mr. Germeraad) Is this June date generally rather late in the season—well, when is the normal peak?

A Well, this figure could be compared very well with the figure that we got in late June in 1967 when we came up with an estimate of nearly 700 fish in Devil's Hole. This is the same time of year, almost to the day, five years. or four years later, in which we got something like one-half of the number that were in Devil's Hole prior to the lowering of the water level.

Q Have you since conducted other fish counts?

A Yes. On April 6 of this year I visited Devil's Hole, and we were accompanied by three divers from the National Park Service and from the Bureau of Sport Fisheries and Wildlife. This was the first attempt

to correlate the total census with an underwater exploration to try to determine how many fish were below the surface at the same time that counts were being made at and near the surface.

We divided up into two groups, counting fish at the surface, taking turns counting fish on the natural shelf [139] and counting fish on the artificial shelf and averaging the values. And then the second method employed was to use a snorkel and face mask and get underwater, which I did, and count fish on the natural shelf and on the artificial shelf.

At the time we were doing this work, the divers were down getting their estimates, starting at approximately 90 feet and working back up toward the surface, and the total figure for April 6, 1972, averaging all these values, was 200 fish.

Q (By Mr. Germeraad) Go ahead.

A On April 27 we ran the second census of this spring. At that time we were unable to get the divers to go with us, and so the counts were not very comparable. And I estimated that the population was at least as great as it was on April 6, namely, 200 individuals.

On June 2 and 3 of this year we made what I considered to be the most accurate census that has been made so far. We had the same three divers, and I was also accompanied by Dr. James E. Deacon, Professor of Biology at the University of Nevada here in Las Vegas, who has been studying the Devil's Hole pupfish intensively for the last five years or more, and we came up with our estimate at that time, based on counts from the surface, counts using a snorkel and face mask, and the counts of the three divers, a total [140] population of 400 fish.



Q (By Mr. Germeraad) Dr. Miller, do you serve in an advisory capacity to the National Park Service concerning the pupfish?

A I do. I have been a collaborator of the National Park Service since about 1961. And I served in the capacity as a scientific advisor on problems having to do with any fish populations in National Monuments or National Parks within the United States.

Q These divers then helped you on these various times, and Mr. Sanchez, who made the count after the November, 1970 service, were these people generally working then at your direction?

A Yes, they were.

* * *

Q (By Mr. Germeraad) What is your expert opinion as to the trend of the pupfish population over the last several years?

A It's my professional opinion that the population size has been dropping because the size of the population [141] depends upon the amount of area that the natural shelf is covered with water. There's a definite correlation between the amount of water on the natural shelf and the total production of fish in Devil's Hole.

Q (By Mr. Germeraad) Have there been any attempts at transplanting the Devil's Hole pupfish to other natural or aquarium locations?

A There have been attempts to transplant the Devil's Hole pupfish to other springs. Four of these were made between 1949 and 1972. There have also been attempts to culture the fish in captivity. Six attempts were made between 1947 and 1972. To date, all the attempts to transplant the fish and get it to reproduce in another habitat have failed, and all the attempts at culture up to the present time have also failed.

Q Have you attempted to stimulate the population in Devil's Hole itself in any way?

A On May 12, 1970, we introduced an artificial shelf 16 feet long and 4 feet wide, made out of fiberglass, which is adjusted so that it remains at a nearly constant level in the water of two feet, so that it will rise and fall as the water level rises and falls.

Later in the same year some artificial lights were installed with the idea that if we could stimulate algal growths this also might help Devil's Hole pupfish to [142] survive.

Q (By Mr. Germeraad) Could you explain the success or lack of success in this effort?

A I didn't hear your question.

Q Could you explain the success or lack of success of this effort with the artificial shelf?

A The artificial shelf was in Devil's Hole for approximately one year, and during that entire time although careful examination was made of it with a face mask and snorkel, no young were observed, no newborn young were observed, on the artificial shelf, and we had no evidence that any spawning was taking place on the artificial shelf.

We did see occasionally fish feeding on the artificial shelf because there was some algal roe on it, but no evidence of any young being born on the artificial shelf. However, on the last census, on June 2 and 3, we did find a few young on the artificial shelf, approximately one per six square feet of artificial shelf.

At the same time, on the natural shelf we got an estimate of a minimum of ten fish per square foot, ten newborn young per square feet.

Q So that then is a factor of sixty times as many young located on the natural shelf as opposed to the artificial shelf?



A That is correct. It would work out to about sixty [143] times production on the natural shelf versus the artificial shelf.

Q (By Mr. Germeraad) Do the pupfish hatch live or do they come from eggs?

A All of the species of pupfish are egg layers. The eggs are laid singly or in small groups, and they adhere to the bottom when they are laid.

Q What size are these? Can these eggs be seen?

A They are about a millimeter in diameter and they can be seen.

Q Have you found any eggs on the artificial shelf?

A I have not observed any eggs actually on the artificial shelf; no.

Q So what is your opinion as to the success with your latest observation on the artificial shelf?

A It would appear that the artificial shelf maybe is being used in a very limited extent for spawning and reproduction.

Q But do you have any definite evidence as yet that fish are actually spawning; in other words, that eggs are there?

A We have not seen the actual spawning act and fish laying eggs on the artificial shelf.

Q But perhaps they are using it to raise the young; is that correct?

A They seem to be using it to raise the young; yes. [144]

Q (By Mr. Germeraad) Would the artificial shelf be sufficient to maintain the population if the natural shelf were not covered by water?

A It is my professional opinion that if the Devil's Hole pupfish is denied all access to the natural shelf, it will not be able to survive beyond or through the

year 1973. A minimum threshold of the population is required.

Now, we do not know exactly what the minimum threshold is, but we can assume from our counts of the mid-winter population that this must be somewhere between one hundred and two hundred individuals.

Q In other words, maybe you need a little further explanation for the Court—what is a "threshold" when you're talking about a "minimum threshold of the population"?

A This is a minimum effective breeding science below which the population cannot fall and hope to recover.

Q With the rate of sixty times in use of the natural shelf over the artificial shelf, then am I correct that you don't think that this is enough then to sustain the population of the threshold number to ensure its existence?

A I think that is a correct statement. We cannot count on the artificial shelf to sustain the population in sufficient size to provide for survival.

Q Dr. Miller, have you yet become familiar with the pleadings in this case? [145]

A I have read certain pages of it; yes.

Q (By Mr. Germeraad) Earlier have you read certain pages of the points and authorities submitted by the defendants?

A Yes.

MR. GERMERAAD: I believe, your Honor, starting at approximately page 4 of the defendants' points and authorities, there are certain articles by designated authors concerning supposed actions of Dr. Miller.

Q On page 4, Dr. Miller, directing your attention to the top half of the page, an article by Sterling Bunnell



is mentioned. Please review that supposed quote from Mr. Bunnell's article, and please tell us whether it is correct.

Mr. Bunnell's article states that: (Reading:)

> "Carl Hubbs and R. R. Miller were successful in convincing the service that the hole was worthy of inclusion in the monument. In doing so, they cited an unusual travertine limestone formation in the hole as a pretext, since park service policy at that time did not consider saving a rare animal species sufficient reason for acquiring land."

Could you please tell me, Dr. Miller, whether you did do these things? In other words, did you make representations to the Park Service in kind of a subterfuge?

A I did not. [146]

Q (By Mr. Germeraad) Dr. Miller—

BY THE COURT:

Q What representations if any did you make to the Park Service, Doctor?

A I have looked through my files on the Devil's Hole pupfish, and I cannot find any letter that I wrote urging them that they set aside the Devil's Hole because of the Devil's Hole pupfish. But I must have written some such letter, but I did not make any claim to citing travertine formation as the reason for doing so.

I simply stated that the Devil's Hole pupfish were worth saving, and should be set aside for that reason alone.

Q (By Mr. Germeraad) There's another article, I believe, on the next page by Mr. Alvin McLane, and there is underscored a sentence: (Reading:)

> *"Hubbs and Miller cited a travertine formation in Devils Hole as a disguise for its inclusion in the national monument system."*

Then is your reply the same to that statement?

A My reply is the same to this allegation as to the previous one, and-that is correct.

Q That you did not urge that the pupfish be saved because of the travertine formation?

A That is correct. [147]

Q (By Mr. Germeraad) In conclusion, Dr. Miller, could you tell us, are the Devil's Hole pupfish in your opinion then dependent upon a shallow area such as this natural shelf that provides for their continued existence?

A So far as all of our knowledge that we have gained from studying this fish intensively in the last five years particularly, we have no evidence to believe that the Devil's Hole pupfish can survive without access to shallow rocky ledges such as are provided by the natural rocky shelf in Devil's Hole.

Q Now, I don't want to embarrass you, Doctor, but are you considered one of the foremost authorities on the pupfish, and the Devil's Hole pupfish specifically?

A That is correct; I am so considered.

MR. GERMERAAD: That's all my questions, your Honor.

THE COURT: Thank you.

BY THE COURT:

Q Doctor, what is the life span of the pupfish?

A There are probably some individuals that are born early in the spring that do not live more than a year. And there are other individuals born late in the summer which probably have a life span of more than a year.

This is about all I can say about them. It is a short life species, but we cannot claim that it is an [148] exclusively annual species, one confined to a year cycle.



BY THE COURT:

Q Thank you. Do you have an opinion why efforts to transplant fish and produce them culturally have failed?

A I think the reason revolves around a delicate interplay between the fish, the water chemistry of Devil's Hole, the temperature, nearly constant temperature of 91 to 93 degrees Fahrenheit, and the unique photo-period—it's probably a combination of these factors, and the production of algae, which are responsible for the unique conditions in Devil's Hole to which pupfish is adapted.

The reason, I think, that light is so important is because we have had no trouble raising many other pupfish species, and raised many myself, and now the door is closed. I think perhaps of the total number of twenty or so species about two-thirds of these have been easily reared in backyard pools, out in the open sunlight, yet no one has had success in rearing the Devil's Hole pupfish or having success in transplanting it. And I think the photo-period is a very important aspect of its biology about which we do not know sufficient.

MR. GERMERAAD: If the Court please, perhaps one more question:

Q What size then were these transplants attempts and why was the particular size of the transplant attempt used? [149]

A The numbers of the fish?

Q (By Mr. Germeraad) Right. How many were transplanted at a time, and why were those numbers used?

A Because of the precarious condition of the population, it has generally been felt that it is advisable not

to remove more than 10 percent of the population at any given time, so that the figures have been mostly around twenty-five individuals.

MR. GERMERAAD: Thank you.

THE COURT: Cross-examination.

## CROSS-EXAMINATION

By Samuel S. Lionel, Esq., of Counsel for Defendants:

Q Dr. Miller, the article which Sterling Bunnell wrote, which appears in the memorandum of points and authorities—

A Yes.

Q —when did you see the points and authorities that counsel was referring to?

A Yesterday afternoon.

Q Now, prior to that time had you ever seen any reference to the Sterling Bunnell article, or had you yourself seen the Sterling Bunnell article?

A The first time that I saw the Sterling Bunnell article is when it appeared in print in California.

Q And when did you see that? [150]

A I don't remember the exact date of publication, but it was within a month after the date of publication of the journal.

Q But it would be some time in 1970?

A I think in 1970; yes.

Q Do you know Sterling Bunnell?

A I met him briefly at the first symposium on fishes at Death Valley National Monument in 1969.

Q And that was the symposium on Death Valley fishes which occurred at Furnace Creek Ranch in 1969, and more precisely on November 18 and 19?

A That is correct; yes.



Q Now, when you first saw that article, did you do anything about it?

A Did I do anything about it?

Q Yes.

A No, I didn't.

Q Did you attempt to communicate with Mr. Bunnell and find out where he got that from?

A No, I didn't.

Q Did you ever see the other article which is referred to in there, referred to in the memorandum of points and authorities, done by Alvin R. McLane?

A That one I have not seen until I saw it yesterday afternoon. [151]

Q (By Mr. Lionel) Do you know who Mr. McLane is?

A No.

Q All right. Now, you were present then at this symposium in November of 1969 at Furnace Creek; is that correct?

A That is correct.

Q And you'll notice in our points and authorities we pointed out that there was a panel or seminar—probably more precisely a panel—on November 18, in which you were the chairman; is that correct?

A That is correct.

Q And Mr. Hubbs was a member of that panel?

A That is correct.

Q Are you related to Mr. Hubbs?

A Yes, I am.

Q You're his son-in-law; is that correct?

A That's correct.

Q And did you read the report of that symposium which was prepared by—is that Mr. Pister?—

A Pister.

Q Pister—and was he present at the time of that panel discussion or that seminar?

A He was taking—the symposium was being recorded on tape, and these are notes that he had interpreted when he made his report from the tapes of the actual symposium; so he [152] was present; yes.

Q (By Mr. Lionel) Was he in effect the official reporter?

A Well, I don't think you could call him the official reporter. He was in charge of the symposium, and was responsible for presenting it.

Q He was in charge of the symposium?

A Yes.

Q And it was his job to prepare a report following that symposium?

A I believe that's correct.

Q And that report was supposed to be published?

A Supposed to be published but it never was.

Q Did you ever see a copy of it?

A Not until almost the next, the following year, one year later; the following symposium.

Q And did you see the report of the panel which you chaired on November 18, 1969, in that report the following year?

A Yes, I did.

Q And did you notice in there the report of that panel, which stated: (Reading:)

> "The first step toward habitat protection in this area was the establishment in 1952 of Devil's Hole as part of Death Valley National Monument. [153] Interestingly, this was done ostensibly because of the unique travertine limestone formations but not to preserve the *Cyprinodon diabolis*, the unique fish inhabitant"?



A I read that.

Q (By Mr. Lionel) At the time you read that—well, was there any discussion held by that panel which you chaired on November 18, 1969, concerning the National Monument Proclamation made in 1952 by President Truman?

A Professor Hubbs was a member of that panel, and he discussed that proclamation because he was the one that was chiefly instrumental in getting the Devil's Hole set aside as part of the National Monument.

Q Was he more instrument than you were in that regard?

A He was by far.

Q By far. I see. And do you remember anything said by Professor Hubbs at that panel discussion concerning this particular matter which appears in the report and which I have just quoted?

A Yes. He pointed out that the National Park Service did not have a policy for setting aside a national monument to preserve endangered species, and therefore he had come up with this idea of pointing out the travertine deposit as a means of getting Devil's Hole set aside as part [154] of Death Valley National Monument.

Q (By Mr. Lionel) And did he tell about his attempts to get it set aside for many years, perhaps as many as ten?

A Well, I don't think he worked on it quite that long, but it took him quite a little while to get some action.

Q And the only way he'd get it set aside was to cite the unique travertine limestone deposit?

MR. GERMERAAD: Are you asking the witness what the Department of Interior did? I don't understand your question.

Q (By Mr. Lionel) Well, you've been in constant communication with Professor Hubbs over the years?

A I see him frequently.

Q I see. Well, what did Professor Hubbs tell the panel? I assume this is all on tape, you tell me?

A Yes.

Q Do you know who has that tape?

A Well, Mr. Pister had it at one time. I don't know whether it's still in his possession or not.

Q Well, what do you recall Professor Hubbs telling the people present at that panel?

A I just stated it.

MR. GERMERAAD: Are you asking him now for hearsay? Is this it? [155]

MR. LIONEL: I'm asking the witness; yes.

THE COURT: Counsel, you're making observations to Mr. Lionel. I prefer you to make an objection if you have any.

MR. GERMERAAD: Then I object that he is asking the witness for hearsay.

THE COURT: Sustained.

Q (By Mr. Lionel) Did you ever talk to Mr. Pister about what appears here in this summary?

A Not specifically.

Q Did you talk to him about anything appearing not specifically?

A I wrote a summary immediately following that first symposium myself, and sent that to him, and that was published, multilithographed along with his summary a year later.

Q Is there anything in that summary that did not occur on that day?

A Well, I'd have to read the summary over very carefully to determine that.



Q I'm talking about particularly page 3.

A I don't have page 3 of that summary here.

MR. LIONEL: Would you mark that, please?

THE CLERK: Defendants' Exhibit B marked for identification. [156]

(Defendants' Exhibit B, being a summary, is marked for identification at this time.)

Q (By Mr. Lionel) And you have seen the summary before?

A Yes, I have.

Q About 1969; is that correct? About 1970?

MR. GERMERAAD: I haven't seen it.

Q (By Mr. Lionel) May I refer you specifically to page 3?

A (Witness examining document.)

I don't see anything on that page that is not correct.

MR. LIONEL: Did you get that, Mr. Reporter?

THE COURT REPORTER: Yes. sir.

Q (By Mr. Lionel) Dr. Miller, this natural shelf that you are talking about that the fish use, what does it consist of? Is there anything unusual about it?

A Oh, it has at one end loose rock rubble, and at the other end there's not much of this material. This is probably rock rubble that was washed into Devil's Hole from time to time in the rare occurrence of rains, and it is amongst these little rocks, rock rubble material, that the young fish are able to hide in and amongst the rocks, and the algae growth is particularly strong at that shallower end of that pool. [157]

Q (By Mr. Lionel) Is there anything unique about that rock rubble?

A Not that I know of. I'm not a geologist, so I can't tell you whether there's anything peculiar about it.

Q You know, don't you, that the water level in Devil's Hole has not always been substantially where it is now?

A Right. That's correct; not where it is now.

Q Well, it has been substantially higher on occasion; you know that?

A I saw Devil's Hole in 1936, and between 1936 and 1967, I didn't notice any significant change in the water level on the shelf.

Q Did you hear Dr. Dudley testify earlier this morning?

A Yes, I did.

Q And did you hear him say that at one time in all likelihood this was a spring, and that it reached the surface of the ground; in other words, water came out?

A Yes, I heard that.

Q And did you hear him also testify that there was considerable evidence that the water level in Devil's Hole had been higher on various occasions?

A I think he said it had been 10 to 15 feet higher; is that correct? [158]

Q (by Mr. Lionel) Well, he also said that but I was—

A At one time he said that it had overflowed.

Q At one time it had overflowed, so I would assume that—

A He didn't specify what time, though.

Q All right. Now, is it your opinion that these particular pupfish in Devil's Hole have only been there while they've had this particular shelf or ledge with that rock rubble?



A No, I don't think that's true. I think they could easily have lived on a succession of shelves that were higher than the present one.

* * *

Q Doctor, do you know any reason why the fish could not thrive if they used a ledge with rock at a lower level than the ledge they now use?

A Yes. I think it would depend on how much lower [159] that level would be than the one that they're now using in reference to the intensity and quality of light that might reach such a shelf.

Q (By Mr. Lionel) And the main reason for that would be because of the growth of the algae which is needed to grow the microorganisms that they feed upon?

A That would be the chief reason; yes.

Q Now, isn't it true that the artificial light or the artificial light that was brought in that was used over the artificial shelf was successful in growing algae on the artificial shelf? In fact, the fish ate the microorganisms which grew in that algae?

A It was successful to a certain point, and beyond that point it was too intense and killed off all of the algae in the artificial shelf so when I went there on April 6, 1972, the artificial shelf was completely covered with a mass of dead algae.

THE COURT: You say "too intense." The light was too intense?

THE WITNESS: The light was too intense.

Q (By Mr. Lionel) And I would assume the light could be properly adjusted?

A That is correct.

Q Now, you say that the fish in fact do eat on the artificial shelf? [160]

A They have been observed to eat, some fish have been observed to eat on the artificial shelf.

Q (By Mr. Lionel) And is it a reasonable hypothesis that perhaps if the natural shelf wasn't there that the fish would use the artificial shelf more than they use it now?

A This could be. But we're talking here about what is going to happen eventually; if the pumping continues and the water level continues to drop, there will come a time beyond which no man-made structure will be of any use to the Devil's Hole pupfish.

Q Why is that?

A Because eventually if the water level drops, say, 15 or 20 feet, then the artificial shelf will completely cover the water level underneath it. There won't be any light getting in whatsoever. There won't be any, because the opening, as I understand, the opening down narrows in the Devil's Hole. Once you get down to a certain level there's a neck which the water goes down through and expands out into lateral chambers.

I've seen sketch maps of the underwater cavern of Devil's Hole, and I can see how an artificial shelf would just form a stopper in this narrow neck, and then the water drops below the artificial shelf and the fish wouldn't even get any sunlight. [161]

Q (By Mr. Lionel) How far down is that neck?

A I don't have the precise figure. Perhaps Dr. Dudley has it. I think it is about 35 feet.

Q You say you dove in Devils Hole?

A No, I never did. I have not. I went in with a face mask and snorkel and just to a depth of about three feet.

Q Did you notice any ledges around there?



A One could see from the surface, just lying on the surface with a face mask and looking down, one could see the next ledge down, which is about 15, 20 feet, something on that order.

Q And there's another ledge about 15 to 20 feet down?

A I think that's the right figure.

Q And that is before the bottom?

A Before the neck.

Q Before the neck. Now, is there any reason why pupfish could not thrive on that artificial ledge if the water were, say, just a few inches above it?

A That is something that would be risking the future of the species, because we do not know what the light quality would be if the water level dropped another 15 feet.

A second factor is that the water isn't suddenly [162] going to go down to that level like pulling a drain out of a bathtub. It will go down gradually. What will the pupfish do between the time they're denied access to the natural shelf they're now using and the time the water level drops to the shelf which is 15 feet or so below, because there's a time span there of perhaps a year or two or maybe three years, and they'll have no place to successfully spawn except to try to use the artificial shelf.

Q (By Mr. Lionel) But aren't there ledges which are just a few feet under the water level, small ledges?

A Not that I know of.

Q Now, let's assume that we use this lower ledge which is about 15 feet or so down, you say the main problem would be the quantity or quality of the light that would get through to that so that the algae could grow?

A That's what I think would be the chief problem; yes.

Q Now, do you know of any reason why there couldn't be appropriate light, artificial light, used for that purpose?

A A proper type of lighting?

Q Yes.

A Could be used to stimulate algae growth.

Q Yes; well, whatever has to be used to stimulate, that's correct. I would assume that could be done? [163]

A I think it probably could.

Q (By Mr. Lionel) There are different species of pupfish in the various springs in Ash Meadows; isn't that true?

A There is one other species, full species, in the springs at Ash Meadows, and it is divided up into two sub-species, one of which lives in a single set of springs and the other lives in the other springs in Ash Meadows.

Q Now, pupfish themselves are pretty hardy, aren't they? In fact, they have survived for many, many years; is that correct?

A Yes.

Q And in different environments?

A That's correct.

Q In fact, the water temperature in Devil's Hole is approximately 93 degrees Fahrenheit; is that correct?

A Varies from 91 to 93 degrees Fahrenheit.

Q And, in fact, these pupfish have lived in colder temperatures about in 30 some degrees Fahrenheit; is that correct?

A 30 degrees Fahrenheit?



Q Yes.

A Not to my knowledge. When you say "lived," they may have survived that temperature, but they do not live. There's a difference between living and surviving. They will [164] not reproduce and live in a permanent population at that temperature; no.

Q (By Mr. Lionel) Well, I am assuming that these fish, pupfish, and I'm including the species in Devil's Hole, have been on the scene for many years, perhaps since the Ice Age?

A Yes.

Q Which is a pretty cold time. And I assume the waters were quite cold in those times?

A There are some pupfish in the Death Valley System that can stand very low temperatures with the water probably down close to freezing and very high degree of temperature in summer. But your Devil's Hole pupfish is not one of those that we know can survive and reproduce successfully at such temperature ranges.

Q Has any Devil's Hole pupfish been taken out and kept in colder water than exists in Devil's Hole?

A Some experimental work on the temperature tolerance of the Devil's Hole pupfish was conducted by Dr. James Brown and one of his graduate students, Dr. *Feldman* (phonetic), and a paper was published on this stating that yes, they can tolerate much lower temperatures, but tolerating temperatures and surviving is two different things.

Q And actually the experiment indicated that they could survive in water having entirely different chemistry [165] than that which exists in Devil's Hole?

A What was that statement?

Q (By Mr. Lionel) That the experiments have indicated that the Devil's Hole pupfish can survive in

waters which have different chemistry than that in Devil's Hole?

A They can tolerate water of different temperatures.

Q But what you're talking about, Doctor, is the question of breeding?

A Right.

Q We're talking about really transplanting them elsewhere so they could breed elsewhere?

A Yes.

Q Now, what is the maximum number of fish that have been taken any place for the purpose of transplanting these fish?

A Seventy-five fish were removed by Dr. Ira Rivers, Chairman of the Department of Biology of the University of Nevada, in 1947, and transplanted to a spring about three miles west of Devil's Hole. This is the maximum number of miles they have ever been removed for transplant purposes.

Q Were there any reports prepared with respect to that?

A Were there any what?

Q Reports or papers?

A He wrote a paper—it appeared in a paper he wrote [166] on insects. He just mentioned in passing that he had taken seventy-five of these fish out and put them in this other spring. And I corresponded with him subsequently and he said that—

Q (By Mr. Lionel) But that's all there is to it. We don't know whether he put them in other springs where there are other pupfish, do we?

A That's correct; we don't know exactly what spring he put them in.



Q And if he put them in another spring where there were other pupfish, the other pupfish could very well have eaten the Devil's Hole pupfish?

A That is correct.

Q Now, where are there transplant experiments going on now with respect to Devil's Hole pupfish?

A On June 13, twenty-five Devil's Hole pupfish were removed from Devil's Hole and placed in a spring well about one mile due north of Devil's Hole as an experimental transplant.

Q Who did that?

A The National Park Service, in conjunction with the State of Nevada Fish and Game Department.

Q Have you had an opportunity to observe that?

A I have not been out. I was hoping I might have a chance on this trip. [167]

Q (By Mr. Lionel) Where else?

A One plant was made several years ago, I think in 1969 or 1970, to a warm spring in *Saline* Valley (phonetic), which is a valley lying between Owens Valley and Death Valley.

Q How many pupfish?

A I think there were twenty-four at that transplant.

Q Did you observe that?

A I never actually observed that.

Q Are there any others going on at the present time?

A Actual transplants?

Q Yes, actual transplants?

A No, not at the present time.

Q Do you know what the Bureau of Reclamation is proposing to do around Boulder Dam?

A Yes, I do.

Q What are they going to do?

A They are building what they hope to be a successful refuge for the Devil's Hole pupfish below Boulder Dam.

Q And in fact they had given out bids for the construction of an appropriate tank for the fish?

A That is correct.

Q Do you know anything beyond that?

A I know that there are some problems with the water temperature, and that the water chemistry is quite different [168] from that in Devil's Hole.

Q (By Mr. Lionel) Are they trying to get water chemistry which would be basically similar to that found in Devil's Hole?

A Well, I don't think they're going to be able to do this, although we don't know for sure that the water chemistry is one of the critical factors, that is, we should have water chemistry similar to Devil's Hole as possible, but it's conceivable that the Devil's Hole pupfish does not have to have exactly the same water chemistry. It's probably, as I mentioned before, a combination of water temperature, light and food, which would work in unison to provide the proper habitat for the successful reproduction of this fish.

Q Now, isn't it true that in the symposium in Furnace Creek in November of 1969, the persons who were present said that transplantation would be a secondary consideration, and that the prime consideration would be efforts to maintain the habitat at Devil's Hole?

A I think this was the conclusion that was reached at the end of the symposium.

Q Of what does the artificial shelf in Devil's Hole consist?



A It is made of fiberglass, 16 feet long and 4 feet wide, supported by styrofoam floats, and then after it was [169] constructed within a couple of weeks a frame of wood was used to give it greater strength. It started to sag in the middle, so that a wood frame was placed underneath it to give it strength.

Q (By Mr. Lionel) Do you think that some other material might be better for the purposes?

A I don't think so, because we have to be very careful not to introduce anything in Devil's Hole that would affect the water chemistry, and fiberglass is certainly one of the most inert materials that could be used.

Q I don't think I got an answer to my question before. Maybe it's my fault or maybe you gave it to me.

Is it a reasonable hypothesis that once this shelf, what you call the natural shelf, is completely above the water level, that the fish would be more apt to use the artificial shelf?

A They would be more apt to use it; yes.

Q Doctor, you filed an affidavit in support of the plaintiff's motion here, didn't you?

A Yes, I did.

Q And you also filed a prior affidavit about a year ago at the time this action was originally commenced; is that true?

A That is correct.

Q Who prepared those affidavits for you? [170]

A I prepared them myself under some suggestions from the Justice Department, because I never prepared such an affidavit before.

Q (By Mr. Lionel) I noticed that the affidavit which was filed this time ended, the last two pages

were typed on a different typewriter. Was there any reason for that?

A There was in the original typing of this second affidavit an error made in the Justice Department, and there wasn't sufficient time. I received the affidavit on the day before I was to depart from Ann Arbor, Michigan, so I had my own secretary correct the typographical error.

Q In fact, there were some changes made in the affidavits, too, weren't there, of substance?

A I don't remember the details. There were certain changes made between the two affidavits, because I had published more papers, and so forth.

Q Well, in the first affidavit, and I'm reading from paragraph 6, you say: (Reading:)

> "The artificial shelf has been used by *Cyprinodon diabolis* for feeding and rearing of young, but how long it can continue to function effectively under a regime that sees the water level of Devil's Hole continuing to fall is questionable."

You remember that? [171]

A Yes, I do; very definitely.

Q (By Mr. Lionel) Now, in the second affidavit, the one that was just recently filed, you don't say that at all?

A That's correct.

Q And now you say there's no evidence there's been any breeding on this shelf?

A That's correct.

Q Aren't they feeding on this shelf, the artificial shelf?

A Yes, they have been seen feeding on the artificial shelf.



Q And aren't the young being reared on that shelf?

A We have noted newborn young on the shelf.

Q Why would your present affidavit say there is no evidence that there has been any breeding on this shelf?

A Because as of May 30 we had no evidence that there was breeding on the shelf.

Q But since May 30 there has been evidence of breeding on the artificial shelf?

A On June 2, on June 2, we detected for the first time the presence of young fish on the artificial shelf. At the time the affidavit was submitted that's correct.

Q In your first affidavit, and I'm reading from paragraph 7—it's actually the second sentence—you say: [172] (Reading:)

> "As the water level"—

and perhaps counsel can give you the copy of these, but I'm reading this and this is what it contains; if you have any questions, just stop me, Doctor—

A All right.

Q (By Mr. Lionel( (Continuing):

> "As the water level continues to drop I anticipate that reproduction will decrease as the species is forced entirely on its man-made (sic) environment."

In the second affidavit, the current one, you say: (Reading:)

> "As the water level continues to drop I anticipate that effective reproduction will fail as the species is forced to rely entirely on its man-made (sic) environment."

Why do you use the word "effective" this time?

A I made great, much more detailed studies in 1972 than I had when the first affidavit was issued.

I did not have anywhere near as much information on the biology of the fish as I gained in the three censuses that we ran this year, April and June, so it was my feeling, after the intimate information that we got from these very detailed studies and observations of the fish, that the effective [173] population, effective breeding of the population, was the factor and would be considered here.

Q (By Mr. Lionel) What you mean is, that the amount of fish that you would have there would probably be lower?

A Lower with respect to what?

Q Well, you're not saying that they could not live on the artificial shelf?

A What I'm saying is, I do not think that the artificial shelf will provide an effective breeding population so that this species will survive. If it has to rely entirely upon the artificial shelf, I don't think the production will be high enough to provide this threshold population that I mentioned previously, which is required for the eventual survival of the species.

Q Do you think the failure to have such a threshold population has perhaps inhibited the projected transplants?

A Well, we certainly have tried to keep the number down because of this idea that we shouldn't remove more than 10 percent of the total population at the time these transplants were made.

Q Now, I take it then that what you say in here in your testimony is based upon the fact that there would only be an artificial shelf to rely upon, and there would be no other kind of perhaps natural rock shelf? [174]

A That is correct.



Q (By Mr. Lionel) And if there was such a natural rock shelf, you feel that appropriate light could be manufactured so as to properly promote the algae growth?

A If there were such a natural rock shelf below the present one, you mean?

Q Yes.

Q I think that if we limit the depth to which we're going to go, that would probably be true; yes.

Q Now, actually, how large is this rock shelf now?

A Well, the original rock shelf is about 16 feet long and 4 or 5 feet wide, and had a maximum depth approaching 3 feet at the deepest point at the dropoff into the main pool.

Q And what is there now?

A It's about 80 percent exposed now, so it's just three feet or something, three feet or, three or four feet. I haven't seen it most recently. On June 2 there was about three or four feet.

Q And it appeared to be thriving on it now?

A What?

Q They appeared to be thriving on that?

A Well, the population has definitely fallen, and because the population size depends upon the amount of water on the artificial shelf, and as the amount of water has gradually dropped the total population in correlation with the amount [175] of water has also dropped.

Q (By Mr. Lionel) But actually it woudln't take a shelf of the same size lower down in the hole for the fish to use, in other words, the original size—?

A If you had one half the size of the original shelf I should think that would be adequate.

Q Or perhaps even a quarter?

A Possibly; but we have to consider what artificial light will have as long-run operation, whether the fish are going to respond in some deleterious fashion to the continued use of artificial light rather than natural sunlight.

This is an unknown factor. It's an abnormal situation.

THE COURT: Excuse me, Doctor.

BY THE COURT:

Q You speak of natural sunlight. Are you talking about the direct rays of the sun?

A In part that, and in part the natural incident light.

Q (By Mr. Lionel) I'm sorry, natural what?

A Natural incident, natural incident light, as well as the direct rays of the sun.

Q But the purpose of the light is to grow the algae?

A Yes. We might get light that would grow algae, [176] but not necessarily be sufficient for the reproductive process of the fish itself.

Q (By Mr. Lionel) Do you think it's technically feasible to do that?

A I don't know.

Q You don't know?

A We could have light that would be sufficient for algal growth but not necessarily in the long run would be sufficient for the whole embryological development of the population growing young.

Q In other words, what you're saying is, we don't know whether or not that would be adequate? It could be?

A That's right. It could be, but we don't know.

* * *



## REDIRECT EXAMINATION

BY MR. GERMERAAD:

Q Dr. Miller, you are an expert on this light that would affect the pupfish?

A I am not an expert on this light; no.

Q In the 35 or 36 years that you have been studying the desert hole pupfish, what has been the maximum water [177] depth in which this spawning then has taken place?

A The maximum water depth was about three and one-quarter feet.

Q (By Mr. Germeraad) So if we were to hypothetically have the present ledge, natural ledge, completely exposed, and supposing that there was a ledge 15 or 20 feet below the water level, is it your opinion that the fish could spawn at 15 or 20 feet?

A From what I know of the Devil's Hole pupfish, and from what I know of the other species of pupfishes, we have no evidence that any pupfish will spawn below a maximum depth of five feet. Most of them spawn no deeper than three feet.

Q At various times during the cross-examination reference was made to several different types of species of pupfish. Sometimes you talked about other types of pupfish or other species of small fish being able to survive in transplanted environments.

Have there been any successful transplants of Devil's Hole pupfish to this date?

A No, there have not.

Q So questions as to whether the pupfish can survive or can be successfully transplanted then would be contrary to all the evidence so far?

A All the evidence so far. [178]

MR. LIONEL: I'm going to object to this question, your Honor. I think that's really asking for conclusion upon conclusion based upon other people's evidence and not that adduced here, and I really object to it.

MR. GERMERAAD: I'll rephrase the question.

MR. LIONEL: May we have the answer stricken, your Honor?

THE COURT: The answer will be stricken.

Q (By Mr. Germeraad) What is your opinion as to the real possibility of successful transplants of the Devil's Hole pupfish?

A I am not very otpimistic because I don't think we have the required information about the light intensity and quality which I judge to be a very important factor in the successful reproduction of this fish.

I have gone to the trouble of trying to devise the proper equipment for measuring the light intensity and quality in Devil's Hole on a year-round basis, but under the present conditions we would not be able to try out this type of equipment.

If we had tried to use this equipment, say, 10 years ago, we might have the information available, but if we're going to adapt to introducing artificial light into Devil's Hole to stimulate algae growth and the water keeps [179] dropping then obviously we don't know what natural light, what the natural photo-period is, and without this information I am not optimistic about the success of transplants.

Q (By Mr. Germeraad) Changing the subject from transplants to the artificial shelf, what is your best judgment as of this date as to the success of maintaining a population on an artificial shelf such as we have at the present time?



A I don't think that we can count on it to provide a sure means of survival of the pupfish.

Q Is this a small doubt, a great doubt?

MR. LIONEL: Well, now, if your Honor please, the witness has testified, and I don't think this is proper redirect examination, and I'm going to object to that question. We really can't qualify a doubt.

THE COURT: Sustained as to the form of the question.

A The artificial shelf is a stopgap device and eventually, as I mentioned, if the water level continues to drop indefinitely, it will not succeed at all. It might tide the species over until such time as the water level could be restored. [180]

* * *

BY THE COURT:

Q Doctor, you first saw Devil's Hole in 1936, did you say?

A That is correct.

Q And about how far below ground level was the surface of the water then?

A About 50 feet.

Q Approximately that area now?

A Yes, approximately.

Q Hypothetically, assuming that the water level was up near the surface, is that a factor at all that would bear upon the species surviving and living? Is there any particular weight to be given the fact that the surface of the water is down 50 feet below the surface?

A Well, we have two factors here. We don't know when the water was at the surface and overflowed. Presumably [181] at the time that Devil's Hole was full and overflowed, the ancestral pupfish gained access to Devil's Hole, and then over a period of time has adapt-

ed itself to the peculiar conditions that we've noted in Devil's Hole at the present time.

But we don't know anything about the time relationship: was it 1,000 years, 5,000 years? I haven't heard any definite testimony given as to the age, as to the actual time of overflow of Devil's Hole, and I don't think we have any objective evidence on the age of the overflow.

* * *

EDWIN PHILIP PISTER,

(called as a witness by the plaintiff, being first duly sworn, was examined as follows:) [182]

* * *

DIRECT EXAMINATION

By John H. Germeraad, Esq., of Counsel for Plaintiff:

Q And could you give us your address, please, Mr. Pister?

A I reside at 437 East South Street, Bishop, California.

Q What is your current position of employment?

A I am currently employed by the State Department of Fish and Game in California as a Fishery Biologist, supervising fishery management and research projects in the southeastern part of California.

Q Do you also hold another position which does not pay a salary at the present time?

A Yes, I do. I'm currently serving as Chairman of the Desert Fishes Council. The Desert Fishes Council is a national organization comprising governmental scientists, academicians, private citizens who are concerned over the survival and well-being of America's desert fishes.



Q Could you give us a little information about your educational background, Mr. Pister?

A I hold a Bachelor of Arts Degree in Wildlife Conservation from the University of California in Berkeley. I hold a Master of Arts Degree from the same institution in Aquatic Biology.

Q And what were the years of these degrees?

A I received my Bachelor's Degree in 1951; my Master's [183] Degree in 1952.

Q (By Mr. Germeraad) Mr. Pister, are you also a member of various professional societies?

A Yes, I am. I'm, of course, affiliated with the Desert Fishes Council as Chairman. I'm a member of the Rare and Endangered Species Committee of the California-Nevada Section of the American Fisheries Society. I'm associate member of Sigma Chi, a national research society. I'm also a member of the Pacific Fisheries Biologists.

Q Mr. Pister, have you over the years published any articles concerning the pupfish?

A Yes, I have.

Q And desert fishes?

A Yes.

Q And in approximate number, how many publications would these number?

A Specifically relating to the desert fishes, there would be three.

Q When did you first begin studying the pupfish generally and then the desert hole or Devil's Hole pupfish specifically?

A The Devil's Hole pupfish? I began my study of the desert fishes approximately 10 years ago; and intensively during the last five years.

Q You mentioned that the Desert Fishes Council, one [184] of its purposes is preservation of various desert fishes; is that correct?

A That is correct.

Q (By Mr. Germeraad) And what plans or what programs have you carried out to attempt any preservation or to help these fishes?

A We have a very extensive program to this point, I might interject, that we have restricted ourselves to those species within the Death Valley drainage system of California and Nevada.

We are now expanding our operations to cover the entire Great Basin and Range province. Specifically, we have conducted preservation programs relating to essentially ten species and sub-species of fishes in the Death Valley system. Some of these have been successful; others have not.

Q I asked Dr. Miller previously about attempts to establish refuges or artificial environment for the desert hole pupfish, and he told me that they were unsuccessful.

What is your opinion?

A I concur with Dr. Miller's observation here. To date we have no knowledge of any type to indicate that any of the attempts have been successful.

Q If you were—and this is hypothetical—to be able to establish an artificial environment, do you feel, is this a solution to the problem of *Cyprinodon diabolis?* [185]

A No.

Q (by Mr. Germeraad) Why not?

A I don't feel it would a successful long-term answer. Our attempts to date have been simply those



in desperation of attempting to keep the species alive until such time as the natural habitat is restored.

The reason for this is that a species of animal is what it is because of the unique environmental forces exerted upon it, where it is and where it evolves, and the minute these animals are removed from their natural environment, they begin a shift in another evolutionary direction.

And this is probably philosophic, actually, but practically why aquarium environment, say, would not be a successful long-term answer to what we're attempting to do.

Q What is the value of the desert hole pupfish to mankind?

A Well, I think we can include the Devil's Hole pupfish along with the other ones we're speaking of here. First off, these fishes have exhibited amazing physiological adaptations. They have learned to survive high temperatures, as high as 112 degrees, and as a genus, low temperatures clear down to nearly freezing.

This is not true, of course, of the Devil's Hole pupfish, which has not exhibit the same ability to withstand [186] temperature extremes as, say, the Owens pupfish which can go to temperatures of essentially 100 degrees Fahrenheit down to 33, just before water would freeze.

Of course, they have learned equally to adapt to low oxygen levels, high salinity. Their osmo-regulatory mechanisms, and defined that would be their ability to adapt to different ionic levels in water, are amazing. This is one of their major interesting features.

Q (By Mr. Germeraad) Is this something that is restricted to the Devil's Hole pupfish, or is this as to all the species; or does it apply specifically to the Devil's Hole population species factor?

A I would restrict this more to the genus. But the Devil's Hole pupfish specifically would have this same general adaptability as would the others, I would think.

Now, we talk about, and this was mentioned earlier, the ability, how hardy these pupfishes are, and their ability to adapt. What we're speaking of here is over long periods of time. We don't say we can take, say, the Devil's Hole pupfish and remove it and stick it somewhere and have it survive.

But the ability of all of these fishes, their hardiness, is derived over generations of time and actually millenia of time. This is where they have gotten these amazing adaptations. Actually, you may think of this as being [187] long, long periods of time. But actually when we speak of the evolutionary development of a species or animal, this is a very short period of time. Ten thousand years for a full species to evolve is practically overnight as we think of evolution.

Q (By Mr. Germeraad) So then are you saying that they have others or generally some of these desert fishes have ability to adapt, and this is an adaptation over many years, and certainly hundreds of thousands, as opposed to two or three or four; is that it?

A This would be essentially my feeling; yes. There are many other reasons, too, why they're valuable to us.

Q Go ahead and tell us, please.

A I think probably the research potential of these fishes—and one of the reasons I am interjecting species other than the Devil's Hole pupfish is because we find other species threatened equally, particularly the other species as I pointed out *nevadensis pectoralis,* the Warm Springs pupfish, and *mionectes,* a sub-species, the Ash Meadows pupfish, which will be affected eventually by the same general water level decline.



Q Well, I think the Court could almost take judicial notice of many types of species being threatened by the enactment of the Endangered Species Act, but I'd like you really to kind of tune in, in a way, just on the Devil's Hole [188] pupfish because that's what we're really concerned with here.

A We'll zero in on that then.

Q (By Mr. Germeraad) You can relate it to others but please—

A As a research potential again, these have then just almost an unlimited future. Right now I know of any number of graduate students who would just literally give anything to have an adequate number of fish to use for experiments at the doctoral level, to go through and do research papers on, if these fish were available. They have been in the past but more recently there have not been adequate numbers received to allow this.

Speaking of species preservation, and of the Devil's Hole pupfish particularly here, these little animals very well may hold the key to our future as human beings as they learn to adapt to these changes in their own habitat, just as we're having to do through our polluted waters and our smog and so on.

And where the Devil's Hole pupfish as an individual is valuable, the great philosopher and evolutionist, Wallace, back in 1964 made a statement that we may take all of the species that have lived on the earth, and live here now, and as the letters of a sentence or the words of a paragraph, explaining our lives, our history, before us, and for each one removed this story becomes that much less intelligible. And I [189] concede that this is very true, as I look at it as a scientist, because if this species does become extinct, and heaven forbid!

we can never bring it back for all the expertise we've developed ecologically in other fields.

We have a very poor understanding of the world in which we live. We tend unfortunately to judge the value of the species in light of our current knowledge of them. In this respect we actually breed by the lamp of our own conceit. I think this is a valid observation here.

In 1972 we just can't judge what somebody might be worth to us in 1982 or 2072.

Q (By Mr. Germeraad) But do you feel that today, even though you don't know what the value may be tomorrow, today do you feel there is enough value for it to be important to man?

* * *

A Thank you, your Honor. I would like to conclude with one other observation here. I think we—and I will [190] admit to being philosophical here—I think the position I have as Chairman of the Desert Fishes Council, you have to have a philosophical overview of what you're trying to do, otherwise it becomes a mechanical thing and it loses much of what we're trying to attempt by the various threats to the species.

And I'm going to conclude with a very philosophical statement, that in the first chapter of Genesis, the first page, literally, man is given his dominion and stewardship over the fish and the fowl of the earth.

Up to this point our stewardship has not been a good one. Stewardship by itself has the obvious connotation of why its use, and why its use certainly doesn't include destroying anything, because we have learned that unless we learn to live with other species than ourselves on this earth—we refer to ourselves as individual species, the genus homo—we cannot continue to live on it long either.



MR. GERMERAAD: I'm going to move from the philosophical to just a few technical matters which were also touched on by Dr. Miller. I don't want to be repetitive:

Q There was mention of a threshold number. Could you give me your view of what, of whether this operates and what that threshold number might be for the desert hole pupfish?

A I would agree certainly that there is a valid [191] theory here of threshold numbers. What this is, we obviously don't know in the case of the Devil's Hole pupfish, because we haven't been successful in establishing it anywhere, I would say that certainly it would be in the neighborhood of what we've attempted here in the recent past, and no less than that, of somewhere in the neighborhood of twenty-five individuals, and hopefully more than that. The larger number you have the greater your chances are, of course, but we've been very limited this way by the overall population within Devil's Hole.

Q (By Mr. Germeraad) Do I understand you to mean that then you believe that the threshold number that's necessary would exceed twenty-five?

A It could well exceed this, yes. We don't know, for instance, if our lack of success in the different experiments we've run has been the result of low threshold or the inadequate number not exceeding the threshold, or some other biochemical factor that we're not aware of.

Q What is your view as to the interrelationship of the natural shelf that we've been talking about today being covered by water or not covered by water, and the continued existence of the pupfish?

A I would say that the artificial shelf has not shown, to this date anyway, that it will do the job. We run then into the theoretical problem—not actually a [192] theoretical problem; it's a very real problem —when the shelf gets down to a point where it hits this narrowing area down at the bottom of Devil's Hole, that we cannot expect it to be usable any more, but if the water should go below that point or even remain just an inch or two above it, I think we cannot at this stage say that the artificial shelf gives us any reason to be optimistic as to its ultimate value to us.

Again, as Dr. Miller pointed out, this is an expedient that's been used in desperation more than anything.

Q (By Mr. Germeraad) Specifically, if the present natural shelf is completely exposed, is now covered maybe by 10, 15 percent, do you in your professional judgment feel that pupfish can survive?

A I would have to answer it this way, Mr. Germeraad. I would say I would hope they could, but I would be very doubtful that they could.

MR. GERMERAAD: I have no further questions, your Honor.

THE COURT: Cross-examination.

## CROSS-EXAMINATION

By Samuel S. Lionel, Esq., of Counsel for Defendants:

Q Doctor, I have no objections to philosophers.

A I appreciate your point, though. [193]

Q (By Mr. Lionel) When you say you would be very doubtful that these pupfish could survive if the shelf they now use was exposed, you don't really have anything concrete? You really don't know; is that a fair statement?

A This is very true; yes.



Q Now, actually, the Devil's Hole, which is an adjunct of the Death Valley National Monument, is an area that people can't go into; is that correct?

A This is right. It's been fenced off.

Q It's fenced off with barbed wire; isn't that true?

A This is true.

Q And unless you had someone from the Park Service to go there with a key to open it up and let you in, a person couldn't even get in there to see the fish?

A This is correct, at present.

Q Well, hasn't it been that way for a period of some years?

A Yes, this is correct.

Q All right. Doctor, I show you what's been marked as Defense Exhibits B for identification, and ask you if you prepared that?

A Yes, I did.

Q And I refer you specifically to page 3 of that exhibit, and ask you if you prepared what is contained on that page? [194]

A Yes, I did.

Q (By Mr. Lionel) And is what is contained on that page true?

A I would put it this way. In any reporting of a verbal output this way, you interpret it to the best of your ability under the circumstances.

Q Do you have a tape with respect to what occurred at that panel discussion on November 18, 1969?

A Yes, there is a tape of this.

Q And who has that tape?

A I have it.

Q I see. May I request that it not be destroyed, Doctor?

A Yes; sure.

Q But where it says here: (Reading:)

"The first step toward habitat protection in this area was the establishment in 1952 of Devil's Hole as part of Death Valley National Monument. Interestingly, this was done ostensibly because of the unique travertine limestone formations, but not to preserve *Cyprinodon diabolis,* the unique fish inhabitant,"

is that fair reporting of what occurred?

A I would have to listen to the tape again, Mr. Lionel, but I would like to add this one point. [195]

Q (By Mr. Lionel) Well, give me an answer to my question, please?

A Okay. Yes. But let me—the "yes" is not—just acknowledging your last statement, not a concurrence with what you implied.

I would say this, that Dr. Hubbs, in making his statement that day, was giving us the basic background of Devil's Hole. He mentioned his frustrations in attempting to have this area set aside, and in so doing he mentioned that the travertine limestone deposits were brought into the picture because this strengthened his overall proposal to the Park Service.

Q But this page—It says on here, and you wrote it—"but not to preserve *Cyprinodon diabolis,* . . ."; you wrote that, didn't you?

A Yes, I did write that.

Q And that was as a result of what you heard Dr. Hubbs say at that panel discussion?

A If I were to write that again, I'd say "No."

Q I'm sure it might be written differently, Doctor, that's my point.



A I think I should add here, though, out of fairness to what we're trying to accomplish, that if I were to have written that, say, six months ago, I would have added "not necessarily or entirely" because there are other [196] features in Devil's Hole in addition to the fish, as you're well aware.

Q (By Mr. Lionel) I understand. But you wrote this. Did all the people who participated at that symposium get a copy of this report?

A Most of them did; yes.

Q Do you know if Dr. Hubbs did?

A I'm sure he did.

Q Did he tell you that this wasn't what was said at that symposium?

A I don't believe we've discussed the matter.

Q How about Dr. Miller, did he ever tell you that that was not said at that panel discussion at that symposium?

A No, he has never said this either, but I will add, too, that Dr. Miller did not participate in that discussion, nor did he state this, as the other paper said.

Q But you're not saying that that wasn't said there, are you?

A No, I'm not saying that. This is the difficulty of trying to report something that people say.

Q And I assume at the time you prepared this you had the tape with you?

A Yes.

Q And used the tape; is that correct?

A Yes; it's one of those things, you listen to the [197] tape and take notes as it goes along.

Q (By Mr. Lionel) Well, what I'm saying is, at the time you prepared this report, you had the tape available—

A Oh, yes, yes.

Q —and in fact used it in the preparation of this report?

A I certainly did.

MR. LIONEL: We offer "B", your Honor.

MR. GERMERAAD: No objection.

THE COURT: It will be received.

(Defendants' Exhibit B, having been previously marked for identification, is received in evidence.)

Q (By Mr. Lionel) Doctor, have you ever gone in the water, underneath the water in Devil's Hole yourself?

A I have never dove in, Mr. Lionel, but I have looked with Polaroid glasses from just above it where I could see a good distance down into the water.

Q About how far?

A I would guess, say, 15 feet.

Q Is there another ledge down there?

A To my knowledge—I'll have to be truthful—I cannot recall at this time.

Q Ever heard anybody say there's another ledge down there, down about 15 or 20 feet? [198]

A Yes, I have.

Q (By Mr. Lionel) Who have you heard say that?

A I believe Dr. Miller made this comment here a short time ago.

Q Have you ever noticed any smaller ledges just below the surface?

A Very—it would depend on how you define a ledge. I would say small areas that would project to a certain extent but not a significant ledge.

Q There's nothing unusual about the ledge that the fish now use, is there?

A Yes—



Q It's a rock formation with rock rubble on it; isn't that correct?

A —the only unusual thing would be that this is probably the only ledge that is maintaining a species all by itself.

Q And this apparently came, as Dr. Dudley said, from falling in from the roof at the time the roof gave way?

A This is what Dr. Dudley said. I'm not a geologist. I wouldn't render an opinion on that. [199]

* * *

Q In 1970 there was another symposium, wasn't there, at Furnace Creek; isn't that correct?

A Yes, there was.

Q And this time it was the Desert Fishes Council?

A Yes.

Q And you again reported that; is that correct?

A That's right.

Q And on page 6 of that it states: (Reading:)

"As an emergency measure, the biologists installed an artificial spawning shelf last May 7. A bank of electric lights to promote food growth was installed July 17. Since then the fish have reproduced well and seem to be at least holding their own."

Do you remember writing that?

A Yes, I do.

Q All right. Now, Doctor, isn't it true that at this symposium the prior year the people who were present decided that they would use their energies to keep that habitat?

A This is correct.

Q And that transplanting of the fishes in Devil's Hole was only a secondary consideration, and that all

energies of the members of the people present would be devoted [200] to keeping that natural fish habitat?

A Not all the energies; our primary effort would remain that way.

Q (By Mr. Lionel) Including publicity and whatever else had to be done for that purpose?

A Yes, although we had not included publicity on the transplant times.

MR. LIONEL: Thank you.

REDIRECT EXAMINATION

BY MR. GERMERAAD:

Q Mr. Lionel mentioned a wire fence of some type that surrounds Devil's Hole at this time.

Has this prevented the facility from being used as a scientific resource by the community and through your knowledge of the Desert Fishes Council?

A No. All valid requests for research have been accommodated within the limitations of the population numbers.

Q Do you have any knowledge as to whether there are also visitors that go to Devil's Hole during the year?

A Yes, there are. There have been official visitors. I don't know what Park Service policy is on people who just come back, come by and want to look down into Devil's Hole.

I do know the news media have been admitted any number of times to both photograph the fish and to report on the problem there at Devil's Hole. [201]

Q (By Mr. Germeraad) Mr. Lionel, towards one of his last questions, asked about your primary purpose or efforts under the Desert Fishes Council and secondary efforts, the "secondary" being the transplant



efforts and the "primary" being the preservation of the habitat itself.

Why did you, or do you agree with this policy?

A No. It's probably not in the context you mean here. Our basic function, as delineated by the Constitution of the Desert Fishes Council, is to promote knowledge and to enhance the basic position of the desert fishes by protecting their habitat.

Q Do you think it is proper to put the primary emphasis on the preservation of the present habitat?

A Yes, I certainly do.

Q Could you tell us why you think that is the proper emphasis?

A I think that this is the necessary thing because the very reason that we try to preserve the species, to maintain them in their current evolutionary direction, is the very thing here, plus the fact that Devil's Hole—we don't know of any other place we can raise them or have pupfish reproduced, that is, Devil's Hole pupfish.

Q Supposing that there was a transplant, would this satisfy the purposes of the pupfish? Is it a solution?

A If there were successful transplants? [202]

Q (By Mr. Germeraad) Yes.

A No.

Q Please explain why.

A Simply because Devil's Hole itself is the habitat in which they evolve, and I might add in which they continue to evolve, but would no longer continue to evolve if they were removed to another location.

MR. GERMERAAD: No further question, your Honor.

MR. LIONEL: Just for a moment.

## RECROSS-EXAMINATION

By Mr. Lionel:

Q You know Mr. Sterling Bunnell, don't you?

A Yes; not well, but I'm acquainted with him.

Q He was present in 1969 at that symposium?

A Yes, he was.

Q And did you read his article: "In Action Tomorrow"?

A Yes, I did.

Q Including the article which Dr. Miller read before with respect to the Presidential Proclamation of 1952?

A Yes.

Q You have read that, haven't you?

A I haven't read it for some time. It's not vivid in my mind, but I have read it.

Q You know what I'm referring to? [203]

A Yes.

Q (By Mr. Lionel) I'm referring to the fact that when Hubbs and Miller got the Presidential Proclamation, they did it in fact—

MR. GERMERAAD: Your Honor, I object. We have contrary testimony about Dr. Miller's reasons—

THE COURT: This is proper. He can cross-examine.

Q (By Mr. Lionel) The statement I'm referring to in Mr. Bunnell's article is the one which I'm going to read now. I'm going to see if that's the same one: (Reading:)

> "In 1940, Carl Hubbs and R. R. Miller first suggested that the hole be made part of the Death Valley National Monument. Park Service naturalists initially rejected the idea, citing its distance from monument headquarters and their doubts as to



> the uniqueness of the species. But in 1952, Hubbs and Miller were successful in convincing the service that the hole was worthy of inclusion in the monument. In doing so, they cited an unusual travertine limestone formation in the hole as a pretext, since park service policy at that time did not consider saving a rare animal species sufficient reason for acquiring land."

Now, that is what I'm referring to when you say [204] you read Mr. Bunnell's article "In Action Tomorrow"?

A "Action in California Tomorrow."

Q "In California Tomorrow," which is something widely read by conservationists in California; is that correct?

A I wouldn't say widely read. It has a rather limited circulation. But it is a California publication.

Q And Mr. Bunnell was present—

A Yes, he was.

Q —at the time of that symposium, and particularly the meeting which was chaired by Dr. Miller at which Dr. Hubbs was panelist and which you reported on page 3 of that symposium, Exhibit B?

A Yes. I would not agree with the article, however, to this extent, that Dr. Miller has never stated that he was involved in that in any way to me.

Q Oh, it was Dr. Hubbs who did that?

A Who made any statements relative to the limestone travertine formations.

Q And what Exhibit B says, that the Presidential Proclamation was not for preserving the *Cyprinodon diabolis?*

MR. GERMERAAD: That's a legal argument which probably would be best saved until the summa-

tion and not as a predicate for a question. So I object to predicating any question on Mr. Lionel's interpretation of the Presidential [205] Proclamation, your Honor.

MR. LIONEL: I was referring to the article on page 3, your Honor.

THE COURT: Objection overruled. It's proper cross-examination.

Q (By Mr. Lionel) You understand my question?

A I think the key point there is the word "ostensibly."

Q Well, the words in here, "but not to preserve *Cyprinodon diabolis*", that came, you say, from Professor Hubbs and not from Dr. Miller?

A This is correct. [206]

* * *

ARLIE JOHN HILLSAMER,

(called as a witness on behalf of defendants, being first duly sworn, was examined as follows:)

* * *

DIRECT EXAMINATION

By Samuel S. Lionel, Esq., of Counsel for Defendants:

Q Where do you live, Mr. Hillsamer?

A I live at 701 I Street in Sparks, Nevada.

Q By whom are you employed?

A The Bureau of Land Management, the Nevada State [208] office.

Q (By Mr. Lionel) And what is your exact job there?

A I'm Chief of the Branch of Lands and Minerals Operations.

Q Do you know the defendants in this action, Mr. and Mrs. Cappaert?



A I have not met Mr. and Mrs. Cappaert.

Q You have not met them?

A I have not met them.

Q Have you dealt with their agents?

A Yes, sir.

Q And who, particularly?

A At one time an Attorney in Reno, Bob McDonald, Robert McDonald; another time, and simultaneously with Mr. McDonald a Mr. Sam Brooks; subsequently, Harold Hochmuth, an official in the company, and a Mrs. Mildred Johnson, are the parties that I recall having dealt with.

Q How about Mr. Delbert Holzman, ever deal with him?

A I think I met Mr. Holzman, but I'm not sure, sir.

Q Okay. In relation to what did you deal with these people, these agents, of the defendants?

A I was approached by Mr. McDonald in 1966, who inquired about the mechanics of exchanges under Section 8 of the Taylor Grazing Act. [209]

Q (By Mr. Lionel) What is Section 8 of the Taylor Grazing Act?

A It is an authority under which we may, in exchange for privately owned land, dispose of by patent federally owned land.

Q And where was this land that was being talked about?

A The area of interest is the Ash Meadows area of southern Nye County.

Q And about how many acres was involved?

A The original area of interest was on the order of 14,000 acres: I think slightly less than that. Ulti-

mately there was selected in eight separate selections a total of just over 13,000.

Q And where generally was this land with relation to the land that was owned by Mr. and Mrs. Cappaert?

A I don't know.

Q Well, actually, I take that back. Actually, it was really their predecessor, Spring Meadows, Inc.; isn't that correct?

A That's correct, sir.

Q And was this land anywheres in relation to fee land which they owned?

A I was told that the Spring Meadows, Incorporated—

MR. GERMERAAD: Object to hearsay of what he was told, your Honor. [210]

Q (By Mr. Lionel) What did you learn, as part of your duties?

A I learned that the company filed its applications and that it claimed ownership in support of other applications for rights-of-way to lands which had formerly belonged to others, previously patented land.

Q But do you know what the main purpose of this acquisition was of approximately 13,000 acres of previously patented land?

A It was represented to me by the applicants that they wished to enlarge upon an existing farming venture and conduct other activities with the land if they were to get it. There was some talk of the possibility of providing homes for workers in the area but—

MR. GERMERAAD: Again I would object to hearsay, your Honor.

MR. LIONEL: He's learned this, your Honor, as part of his job.

THE COURT: Overruled.



A (Continuing) —the major emphasis—

THE COURT: These are representations made by the applicants to the Bureau of Land Management?

MR. LIONEL: Correct, your Honor.

THE COURT: You may continue.

Q (By Mr. Lionel) And what did you learn? [211]

A The major emphasis, sir, was on the possibility of enlarging upon a farming operation.

Q (By Mr. Lionel) How about livestock?

A Yes, of course; with livestock.

Q Were you here in Court today and heard the testimony with respect to this Exhibit 11?

A I think that one; yes, sir.

Q And I think you heard Dr. Dudley testify that the area shown in red was fee land owned by the defendants.

Did you hear that?

A I heard that, sir.

Q And do you know whether or not the 13,000 acres or a portion of it is encompassed in this land which is shown here in red on Exhibit 11?

A I can only suspect from an inspection of that map from a distance—

Q Would you like to go over to it and take a look at it now?

A I don't have title records with me to the end that I could verify precisely what is patented to Spring Meadows, Inc.

Q Would the patent that was ultimately issued to Spring Meadows, Inc. refresh your recollection?

A Yes. I have the legal description.

Q You do have. I have not seen your files, have I, [212] Mr. Hillsamer?

A You have not, sir.

Q (By Mr. Lionel) And you're here pursuant to a subpoena?

A That's right, sir. There is in this file the same legal descriptions that are on the patent.

Q Well, would the patent refresh your recollection?

A Oh, yes, yes; of course.

MR. LIONEL: Your Honor, perhaps we can save time by offering C-1 which is a patent from the United States to Spring Meadows, Inc. of 5,645.33 acres.

THE COURT: It's marked "C-1"?

MR. LIONEL: It's marked "C-1", your Honor.

THE COURT: You're offering that.

Any objection?

(At this time Defendants' Exhs. C-1 thru C-10, being patents, are marked for identification.)

MR. GERMERAAD: No, your Honor.

THE COURT: It will be received.

(Defendants' Exhibit C-1, being a Patent, is received in evidence at this time.)

Q (By Mr. Lionel) I show you what is marked as Defendants' Exhibit C-1 in evidence, and ask you—I'll lay the foundation backwards—and ask you what it is?

A I'm sorry, I didn't hear you.

Q Will you tell me what it is, please; if you know? [213]

A This is a patent.

Q (By Mr. Lionel) And who was it issued by, and to whom?

A It was issued by the United States acting through the Bureau of Land Management, and issued to Spring Meadows, Incorporated.

Q Did you have anything to do with it?

A Yes, sir.



Q What did you have to do with it?

A I supervised the preparation and the processing of the documents that led to the issuance of that patent.

Q Now, this patent was for 5,645.33 acres; is that correct?

A Yes, sir.

Q Is that a portion of the 13,000 acres you were discussing before?

A It is, sir.

Q And was this patent issued pursuant to a federal statute dealing with the exchange of lands?

A It was, sir.

Q And do you know what lands were exchanged by Spring Meadows to the Government in exchange for that patent?

A Generally, yes, sir; and specifically, by reference to the file.

Q What generally? [214]

A Generally, they are in northeastern Humboldt County.

Q (By Mr. Lionel) And who selected those lands?

A I don't know who selected those lands.

Q And—well, did the Government select them and request them?

A No.

Q You don't know?

A They were offered in the exchange. I don't know who selected them.

Q Would you have anything in your files which would indicate who selected those lands in Humboldt County to be exchanged for the lands contained in this patent, C-1?

A It is unlikely that there is anything in this file.

Q I see. Could there be something in there?

A There is a possibility of discussions that may have gone forward—

Q Okay.

A —between the exchange proponent.

Q All right. Now, do you know why this patent only contains 5,645.33 acres, and why it did not contain 13,000 acres as was originally proposed as part of this exchange?

A Yes, I do know.

Q Why? [215]

A Because the remaining lands that were classified for disposal by exchange were not immediately available by virtue of conflicting mining claims, and subsequent to the patenting of this fifty-six hundred and some odd acres, the Secretary of the Interior vacated the classification of the remaining lands for disposal by exchange.

Q (By Mr. Lionel) Do you know why that was done?

A I don't know all of the reasons why.

Q What reasons do you know?

A I know that there was a large body of objection raised to completion of the remainder of the exchange.

Q Because of pupfish?

A This was among other reasons. There was a supposition that the passage of additional lands into private ownership would increase, result in an increase and demand for ground water.

Q All right. Now, in the original 13,000 acres, did it include any lands around Devil's Hole?

A The lands that were classified, the 13,000-plus acres that were classified, did not include any lands closer than a mile to Devil's Hole.

Q Well, before this patent was given, that is, Defendants' C-1, what was done to see whether there were



any objections from any Government agencies to the proposed exchange? [216]

A The exchange proposals—again, there were eight of them related—were all given the routine exposure of public meetings, requests for comment by range users, our grazing group of depositors board, the county commissioner—these transactions were given the routine treatment.

Q (By Mr. Lionel) How about from the Park Service?

A Yes, Park Service certainly; and U.S.G.S.

MR. GERMERAAD: Your Honor, I'm going to object on lack of foundation, how a man from the Bureau of Reclamation knows what the Park Service is doing, unless a proper foundation is laid.

MR. LIONEL: He's not from the Bureau of Reclamation, your Honor; Bureau of Land Management.

MR. GERMERAAD: Okay, then the B.L.M., how can he know what the Park Service is doing?

Q (By Mr. Lionel) Could you tell the Court just exactly how you would know how the National Park Service would be involved in this particular swap or exchange of land?

A Yes. The Park Service was invited to comment, and this is a matter of record. And this is because the Park Service is an administering agency of public land nearby.

Q Well, when you say "it's a matter of record," what record?

A The classification, the land classification procedures involved maintaining a record of entities and [217] individuals who received copies of decision proposals, which included invitation to comment. And the Park Service was a recipient of this.

Q (By Mr. Lionel) And did the Park Service make any objections to this exchange because of any part of the land would be near Devil's Hole?

A A qualified objection; yes.

Q And what was the extent of that qualified objection?

A The extent of it, if I understand your question correctly, was that the Park Service expressed concern for the possibility of water withdrawals within a mile of Devil's Hole.

Q So, as I understand it then, the Park Service objected to there being any lands classified for the exchange which would be within one mile of Devil's Hole because of possible water withdrawals within that one mile; is that correct?

A They objected—it's correct to the extent they objected to land disposal within a mile of Devil's Hole.

MR. GERMERAAD: Your Honor, I'd like a standing objection to Mr. Hillsamer's being able to speak for what the Park Service did.

THE COURT: He's talking about records of his own agency. You can cross-examine on that. [218]

THE COURT: What's the date of C-1, Mr. Lionel?

MR. LIONEL: The date of C-1 is October 14, 1969.

Q As a result of those objections from the Park Service, was area within one mile from Devil's Hole left omitted from this exchange?

A That's correct. It was withheld from disposal classification.

Q And, as a matter of fact, the original request for the exchange made included the land which was contiguous to the Devil's Hole area; is that correct?

A I believe that is correct, sir.

Q Would your records reflect that?



A Yes.

Q Would you please check?

A (Witness examining records.) Devil's Hole is in Section 36 of Township 17 South, Range 50 East; is that correct?

Q That's correct.

A The selection in this particular case does not show a selection that near to Devil's Hole. However, as I mentioned earlier, there were eight selections, and I'd have to refer to a file that you did not ask me to bring, Mr. Lionel, because these are consolidations of the "8" and the "2". [219] (Witness examining document.)

Q (By Mr. Lionel) Mr. Hillsamer, would it help you any if I referred you to a notice of classification which apparently has a date of May 6, 1968, and which refers to the protest by the National Park Service?

A The notice of classification quite likely reflected adjustments made after the Park Service protest had been considered and culminated.

You asked if the original selection included lands within a mile of Devil's Hole.

Q Well, what I'm trying to find out is, whether as a result of a protest made by the National Park Service, land within one mile of Devil's Hole was deleted from the classification so that it could not be included within the exchange?

A That is correct sir.

Q That is correct?

A Yes, sir.

Q In other words, it was originally within the area which Spring Meadows, Inc. sought to have exchanged for land in Humboldt County but because of a specific protest made by National Park Service, land within one

mile of Devil's Hole was excluded or removed from the classification and therefore not included within the exchange?

A That's correct, sir. [220]

Q (By Mr. Lionel) Now, at the time the exchange was made, was it required under federal statutes that there be appraisals of the lands being exchanged by both parties?

MR. GERMERAAD: First of all, I'd want to object, whether the witness is competent to answer the question either by training or experience. So far as I know he is not an attorney, and I wonder whether he's capable of telling us the answer to a legal question.

So I would object to the question, your Honor.

THE COURT: He's the Chief of Lands and Minerals of the Bureau of Land Management.

I assume these matters take place in the routine duties in your office; is that right, sir?

THE WITNESS: Yes, sir.

THE COURT: Objection overruled.

Q (By Mr. Lionel) Do you remember my question?

A The answer to your question is "Yes."

Q In other words, your appraisals were made of land in Humboldt County which the Government received as a result of this exchange and appraisal made of the Government land was here in Ash Meadows area which the Spring Meadows would receive; is that correct?

A That's correct, sir.

Q And would your file reflect whether in making the appraisal of the Government land which was being exchanged, it [221] included the fact that they could drill wells on that land?



A The appraisal report—

THE COURT: Are you talking about Humboldt County now?

MR. LIONEL No, I'm talking about the land here, your Honor, which the Government had, and which was exchanged, and which was included in the patent.

A The appraisal report did discuss the pros and cons of availability of water upon the value of the real estate.

Q And the ability to get well permits to drill wells on the land which the Government was going to exchange and transfer to the Spring Meadows, Inc.?

A The appraisal report—this is my recollection, sir—the appraisal report is not a part of the file here today because it was taken therefrom two or three weeks ago and made available to our sister agency in another matter.

Q Do you know what sister agency it was?

A Yes; the Bureau of Sports Fisheries and Wildlife Game in Portland. And they have an appraisal problem unrelated to this. And asked that they be given the appraisal report from the closed file for use in another matter.

Q Now, is it a fair statement to say that during the entire course of your dealings here with Mr. McDonald, with Mr. Brooks—was it Hochman?— [222]

A Hochmuth.

Q (By Mr. Lionel) —Hochmuth, and Mildred Johnson, who was representing Spring Meadows, Inc., that at all times you were fully informed that this land was to be used for agricultural purposes, not including livestock, and perhaps to build some homes on?

A This is what the applicants represented, these people represented to us.

Q Is it a fair statement to say that all the agencies that were involved, pursuant to the procedures of the Bureau of Land Management, were aware that this was the situation?

A I don't know, sir.

Q Do you have any reason to believe otherwise?

A No, sir.

Q What is the Las Vegas District Advisory Board?

A It is a group of elected livestock men and representatives of other interests, including wildlife, and that advisory board position is appointive, which advises the district manager in matters pertaining to management of the public domain.

Q And was the Las Vegas District Advisory Board advised of the purposes of this proposed exchange?

A They were advised of the pendency of the application.

Q And the reason for it? [223]

A I don't know what you mean by "the reason for it."

Q (By Mr. Lionel) Well, the fact that the purpose of the exchange was so that Spring Meadows would acquire this land and use it for agricultural and livestock purposes?

A I don't know as to what extent they were made specifically aware of the expressed intent of the applicant.

Q I see. Do you know whether or not this land now is being used for any purpose except as represented to you to be the purposes for the exchange and the intent for which it was to be used?

A I don't know what it's being used for, sir, because I haven't been there.



MR. LIONEL: I see. I have nothing further of the witness.

THE COURT: Cross-examination.

CROSS-EXAMINATION

By John H. Germeraad, Esq., of Counsel for Plaintiff:

Q Mr. Hillsamer, when were you subpoenaed?

A Thursday, last.

Q Were you also given a subpoena duces tecum?

A Yes, sir.

Q Mr. Lionel asked some questions about the reasons that certain lands were withdrawn, and you gave an opinion [224] as to the reasons for it. And I believe you said that the person who made the decision would be the Secretary; this is the Secretary of the Interior?

A Yes, sir.

Q (By Mr. Germeraad) Have you ever talked to the Secretary of the Interior as to what his reasons to take certain action?

A No. I am aware of certain information, certainly not all given to the Secretary.

Q These records which you brought along today, are you a custodian of these records?

A I am, while they're in my possession. I am not ordinarily the custodian of the records in our organization. I have access to them.

Q You have access. But you're not the custodian?

A I'm not the official custodian of land office records.

Q And you do not maintain these records; is that correct? I mean, are you responsible for the compilation of bringing all these papers together?

A I am responsible for the compilation— [225]

* * *

Q (By Mr. Germeraad) So are you in charge of compiling these records?

A I am in charge of the unit that prepares portions of these records.

Q Thank you. Mr. Hillsamer, have I ever met you before?

A I don't think so, sir.

Q I don't think so either.

MR. GERMERAAD: I would, your Honor, make a motion to strike the testimony as it relates to what the records may or may not contain, since Mr. Hillsamer is not the custodian of these records.

I realize he may know portions of these records, but I have no idea how much, and this has not certainly been brought out. So I would make a motion to strike his testimony.

THE COURT: Motion is denied.

MR. GERMERAAD: I would make a request, your Honor, that since I was not advised of the subpoena or subpoena duces tecum, I had never met or know about the situation, that I at least be allowed to continue cross-examination on Wednesday. I'm not sure that I will have [226] any further questions. But if it becomes necessary, I would like to have that privilege, your Honor.

THE COURT: You're not prepared to go forward now?

MR. GERMERAAD: What, your Honor?

THE COURT: You're not prepared to cross-examine now?

MR. GERMERAAD: I'm not prepared to continue my cross-examination at this time, your Honor.

THE COURT: I think your request is a reasonable one.



MR. LIONEL: Except this, your Honor. I told counsel on the telephone at least two weeks ago that I would give him advance notice, and I told him what my answer would be, and pointed out that we would have an affirmative defense in our answer, which we put in, that we had gotten this land from the Government for specific purposes, namely, for the agricultural and livestock uses, and that we were claiming an estoppel against the Government who set up the claim that they were making in this particular case.

As a matter of fact, when I asked Mr. Hillsamer when he pulled the records, I had assumed that the Department of Justice or someone in the Interior had pulled them for that purpose. [227]

MR. GERMERAAD: But you know now, of course, that that is not the case; isn't that correct?

THE COURT: In view of the motion to strike let me make certain I'm clear on this:

BY THE COURT:

Q Mr. Hillsamer, you were the official of the Bureau of Land Management that handled this exchange yourself?

A Only portions of it, sir. The paperwork processing; yes, sir. The decision to dispose or retain the land, these are not committed to me.

Q And who would make that decision?

A The initial decision is made by the—

Q District Director or—?

A —by the district manager here in Las Vegas; and the final decision as to the lands not disposed of was made by the Secretary of the Interior.

MR. GERMERAAD: I have another question—

THE COURT: Just a moment.

Q Insofar as the work done in Nevada, though, the file was on your desk, so to speak?

A Many times, sir.

THE COURT: All right.

Well, I think that in view of the surprise that Government counsel has evidenced you'll have to return Wednesday. I appreciate the inconvenience. [228]

Q (By Mr. Germeraad) I have one question now that I think I can ask, and that is: Who initiated the request for the exchange?

A The proponents, Spring Meadows, Inc. [229]

* * *

THOMAS MILTON HUMPHREY, JR.

(called as a witness by the defendants, being first duly sworn, testified as follows:) [230]

* * *

DIRECT EXAMINATION

By Samuel S. Lionel, Esq., of Counsel for Defendants:

Q Where do you reside, Mr. Humphrey?

A 1501 Flag Circle, here in Las Vegas.

Q And by whom are you employed?

A The Atomic Energy Commission.

Q And what's your occupation or profession?

A I'm a geologist.

Q Are you in charge—are you a hydrologist?

A I'm Chief of the Geology-Hydrology Branch. That makes me a hydrogeologist.

Q The Atomic Energy Commission here in Nevada?

A Yes.

Q And you're here pursuant to subpoena?

A Yes.



Q You never talked to me or anyone from my office before?

A No.

Q You don't even know who I am?

A That's right.

Q Have you talked to the Government about your testimony here today? [231]

A Not to any real length. I have mentioned that I made a dive in Devil's Hole.

Q (By Mr. Lionel) To whom did you mention that?

A To the opposing lawyer.

Q When did you tell him that?

A Oh, a phone conversation, probably—was it Friday?

Q All right. You haven't talked to him since Friday?

A I said "Hello" to him Monday.

Q Okay. Were you here in Court on Monday?

A Yes.

Q And observed the proceedings?

A Yes.

Q And listened to the witnesses?

A Yes.

Q Now, did you dive into Devil's Hole sometime last week?

A Yes.

Q On what day?

A The 27th.

Q Just on the 27th?

A Of June; yes.

Q And you were there with Mr. Peter J. Mehringer and Mr. C. Vance Haynes, Jr.?

A Yes. [232]

Q (By Mr. Lionel) And the three of you dove down?

A Not together. We may have been in the pool at the same time, but they pursued their observations and I pursued mine.

Q What were your observations?

A It's a beautiful spring to dive in. I saw nothing that would reflect on lowering in the water level of the spring during the dive.

Q What was your purpose in being there?

A I received a call from Dr. Dudley, and he asked me to dive in the hole and observe any geological results that could have been caused by a lowering at some time in the past of the water level in the spring.

Q When did you talk to Dr. Dudley?

A Several weeks ago. I really don't have the exact date.

Q Do you know Dr. Dudley?

A Yes.

Q I see. Were you present at the time observations were made with respect to whether or not there were higher water stands in Devil's Hole?

A Higher stands?

Q Yes.

A I made this observation on my own. I don't believe I was there when others were making this observation. [233]

Q (By Mr. Lionel) When did you make those observations?

A On the 27th as well as several years ago when I first saw Devil's Hole.

Q And what did you observe with respect to whether or not there were higher water stands in Devil's Hole?



A I noted deposition of what I took to be calcium carbonate quite a bit higher than the water level, and I guess what was referred to as bathtub rings at a previous session.

Q Have you seen a report of the Desert Research Institute prepared by Dr. Mehringer and Dr. Haynes?

A I have not.

Q I see. Did you notice any ledges below the water level in Devil's Hole?

A I noted some very minor ledges that I took to be the result of fracture.

Q Well, I didn't ask you that.

A I'm sorry.

Q Now, you may work for the Government, but you don't represent the Government now. So I'm asking you if you observed ledges below the water level?

A Yes.

Q Was there more than one?

A There was a number of minor, not elongated, ledges. [234]

Q (By Mr. Lionel) But you did observe ledges?

A Uh-huh; yes.

Q Numerous ledges?

A I would not say numerous; I would say two or three perhaps.

Q Well, you were down there what day?

A The 27th.

Q Did you make any notes?

A No.

Q No notes of any kind?

A No.

A It's difficult to write under water.

Q Well, don't you make notes when you get out and get above the water?

A If I were doing a geological research effort I would have.

Q All right. Now, you say there could have been more than three ledges that you observed there?

A Yes.

Q At what depth?

A At varying depths.

Q Such as—?

A I did not have a depth meter.

Q At approximately how many feet below the level of the water?

A Greater than ten feet. [235]

Q (By Mr. Lionel) What?

A At a greater depth than ten feet.

Q None less than ten feet?

A None that I observed.

Q Did you observe a large ledge about twenty feet below the surface?

A I observed a shelf.

Q A shelf?

A Right.

Q Something like the shelf that the pupfish now live on around water level?

A Yes.

Q And how large was this shelf?

A I would say it was approximately the same size as the one on the surface.

Q All right. But you don't know how far down it was?

A I looked at the depth gauge on my diving partner, and it was approximately fifteen feet below the surface.

Q Yes. Did you notice any algae on it?

A No.



Q Did you notice any algae on any ledges below the water surface?

A I did notice some dead or black-colored gobs of algae that I felt had fallen in from the surface.

Q You didn't observe any algae growing any place [236] underneath the surface; is that what you're saying, Mr. Humphrey?

A Below the—

Q Below the surface of the water?

A Below the present shelf.

Q Below the present shelf?

A No, I didn't.

Q Is it possible there were some that you had forgotten about it?

A No, not that I had forgotten about it. Perhaps I didn't recognize it, being I'm a geologist.

Q Were you looking for algae?

A I was looking for anything below the surface that was there; not specifically algae.

Q That was there, or that would indicate a lower water stand?

A That was the—no, I was not looking for any evidence to point out a lower or higher water level. I was looking simply for any evidence that would suggest anything geologically. I wasn't really looking for anything specific.

Q Now, when you got out of that Devil's Hole on that day, did you call Dr. Dudley?

A No.

Q Did you call anyone with respect to this case?

A No. [237]

Q (By Mr. Lionel) You did nothing until you received my subpoena?

A That's right.

Q You didn't call the Government before that?

A No.

Q I see. Did Dr. Dudley ask you to tell him what you saw under there?

A No, I don't believe so.

Q You knew the report was being prepared for the Desert Research Institute, didn't you?

A I was not positive, but I presumed one would be prepared.

Q Did you make any attempt to get a copy of that report?

A I asked Dr. Maxey if such a copy were available. I expressed an interest in it.

Q When did you ask Dr. Maxey that question?

A Oh, let's see, that must have been Monday.

Q What did he tell you?

A He didn't know that such a report was being prepared.

Q Have you since seen a copy of the report?

A No.

Q Did you have the occasion yourself to look at, say, any place within two feet of the water level to see [238] whether there had been a low water stand?

A I observed the sides of the spring from the water level down to about 65 feet.

Q (By Mr. Lionel) Did you pay any particular attention to the first two feet below the water level?

A No more attention than I devoted to the other depths.

Q I see. Isn't it true that if you had these calcium carbonate deposits that after awhile, if the water becomes higher, that these deposits will disappear?

A Ordinarily this may be the case, but I don't believe it would be the case in Devil's Hole because of the—



Q I didn't ask you if you don't believe.

A I'm sorry.

Q Did you discuss with Mr. Mehringer or Mr. Haynes any of their findings?

A Very superficially; and at the time of our discussion, they had observed nothing more than I had observed.

Q I didn't ask you that. Now, please, Mr. Humphrey, I'm going to ask the Court to admonish the witness, your Honor, to answer the questions.

THE COURT: Try to answer the questions.

THE WITNESS: Surely; I'll be pleased to.

Q (By Mr. Lionel) Who did you discuss it with? [239]

A With both of the gentlemen that you mentioned.

Q (By Mr. Lionel) At what point?

A Following a dive, we were sitting in Devil's Hole above the water.

Q Do you know how many days they dove in the water there?

A I understood they dove on the 8th as well as the 7th—28th as well as the 27th.

Q I see. Now, this ledge you say was about fifteen feet below the surface of the water, you say that was a single shelf, ledge or shelf, the same kind of shelf as the Devil's Hole pupfish, as there is around the surface; isn't that correct?

A It was similar.

Q In what respect was it different?

A It had a good deal of rock rubble that had fallen from above, I presume.

Q Except for the rock rubble, what was the difference?

A Lack of algae, I presume.

Q Lack of algae. That was the only difference?

A Yes.

Q Do you know where the algae comes from?

A I'm not sure I understand your question.

Q Where does algae come from?

A Sunlight enhances its growth; I understand this. [240]

Q (By Mr. Lionel) Enhances its growth?

A Yes.

Q Is that correct? Does algae grow under water?

A Yes.

* * *

CROSS-EXAMINATION

By John H. Germeraad, Esq., of Counsel for Plaintiff.

Q You were asked by Mr. Lionel if you had observed some small ledges beneath the surface of the water.

What size were the, not the ledge or shelf which was 15 to 20 feet below the water, but the smaller ones which you did mention, could you describe what size, shape, and what they looked like?

A Yes, I'd be very pleased to. They may have stood out from the fault face not more than five or six inches, and they would be no more than perhaps twelve inches in length. They represented to me— [241]

* * *

Q (By Mr. Germeraad) Five or six inches wide, and maybe twelve inches long. Then this would not even be the same size as the shelf above the water then?

A I think we're interchanging shelf and—

Q Ledge?



A —ledge. Perhaps if I could describe these things a little bit?

Q Please do.

A It appeared to me that they were the result of the major faulting and were minor fractures associated with that faulting, and represented simply just the way the rock breaks.

Q If this was a fracture, as you describe, would this indicate that this would be evidence of a previous lower water level in Devil's Hole?

A I did not consider it as such.

Q A shelf then as opposed to a ledge, you said, was approximately 15 to 20 feet below?

A Yes.

MR. LIONEL: Well, if your Honor please, the witness said it was 15 feet.

MR. GERMERAAD: At an earlier date he also said it was 20. I believe I can ask him. [242]

THE COURT: Cross-examination.

A I would settle for approximately 15 feet.

Q (By Mr. Germeraad) Did this slope at an angle? Was it rather horizontal?

A There was a gentle slope toward the deeper part of the spring.

Q You were also asked whether or not calcium carbonate deposits of bathtub ring effect would disappear if they were below the surface, and you were going to continue a response.

Would you please give that to the Court now?

A Yes. In water as saturated with calcium carbonate as this spring water is, they would have very little effect on the calcium carbonate deposit under water.

BY THE COURT:

Q These markings or rings would not disappear over a period of time?

A They would not, they would not dissolve in a supersaturated or saturated solution.

* * *

REDIRECT EXAMINATION

BY MR. LIONEL: [243]

Q (By Mr. Lionel) Did you observe a shelf partly covered by rock fall on the northwest wall at the junction of the rock fall in the center of the hole, which was exposed for approximately two feet, and is about a foot wide and twenty-three inches below the present water surface?

And I represent to you that I'm reading from a report to the Desert Research Institute prepared by Doctors Mehringer and Haynes.

A Is this the major shelf that we're talking about?

Q No. I'm talking about one twenty-three inches below the present water surface?

A No, I did not observe this.

* * *

Q (By Mr. Lionel) Fine. Did you observe a three-inch wide smooth ledge at about fourteen inches below the [244] water surface which was exposed for about a foot?

A No, I did not.

Q (By Mr. Lionel) Did you observe any smooth ledges?

A The ledges that I have previously described, the upper surface of them were relatively smooth.



Q Do you, as a geologist, know why those ledges would be smooth? What would cause them to be smooth?

A I attribute it to the fault movement, to slick water-smooth sides.

Q Could it be the result of there being a water level which was approximately the level of that shelf which would by constantly lapping it cause it to become smooth?

A Could I answer this by saying more than yes or no?

Q Surely. I'm asking you whether that could be one of the reasons for it?

A The action of water smooths rock. I noted no smoothing on the present ledge that the pupfish are living on, however.

Q Well, I didn't ask that. I got the answer to the other question.

Now, let me ask you one other thing. I believe Dr. Dudley testified here on Monday that calcium carbonate deposits could be removed because water would remove such [245] solutions.

Do you disagree with Dr. Dudley if he testified to that effect?

A We're not speaking specifically of any—

Q (By Mr. Lionel) I'm talking about calcium carbonate deposits.

MR. GERMERAAD: Your Honor, I would make an objection that Mr. Lionel is misconstruing the testimony of Dr. Dudley.

MR. LIONEL: The record would show it, your Honor.

Q I'm asking the witness whether he disagrees with Dr. Dudley?

A No, I do not disagree with Dr. Dudley.

Q In that respect, do you disagree?

A Calcium carbonate is soluble to an extent in water.

Q And if there were calcium carbonate rings below the present level of the water in Devil's Hole, and then the water, as a result of a high present water stand, could erase that, couldn't it?

A Not specifically in Devil's Hole because of the calcium carbonate content of the water itself.

Q So what you're saying is, that if there were calcium carbonate rings, that they would not become, could [246] not dissolve because of the calcium carbonate content of the water; is that your statement?

A Yes.

* * *

BY THE COURT:

Q Mr. Humphrey, what caused you to go over to Devil's Hole and make this dive?

A Dr. Dudley asked me to dive in his place. I'm a certified diver and geologist.

Q And he told you what?

A He did not tell me to look for anything specifically.

* * *

GRANT ALLAN ENGSTROM

(called as a witness by the defendants, being first duly sworn, testified as follows:) [247]

* * *

DIRECT EXAMINATION

By Samuel S. Lionel, Esq., of Counsel for Defendants:

Q Where do you live, Mr. Engstrom?

A Pardon?



Q Where do you live?

A At 13405 Mahogany Drive, Reno, Nevada.

Q What's your occupation or profession?

A Consulting engineer.

Q As consulting engineer, have your duties frequently had to do with respect to water and the sinking of wells and locations and water permits and things like that?

A Yes. I'm a water rights surveyor of the State of Nevada.

Q And for how long past have you been a water rights surveyor in the State of Nevada?

A Approximately two, two and a half years now.

Q How long?

A Two, two and a half years now.

Q And are you familiar with the Ash Meadows region?

A Yes, sir.

Q And particularly where the Spring Meadows Ranch is located?

A Yes, sir.

Q And have you performed work for their ranch, or more specifically, for Mr. and Mrs. Cappaert who are the [248] defendants in this action?

A Yes.

THE CLERK: This is Defendants' I.

(Defendants' Exhibit I, being map with overlay, is marked for identification at this time.)

Q (By Mr. Lionel) I show you Defendants' Exhibit I, which is the exhibit the Clerk is present putting up on the easel, and ask you if you prepared that?

A I did.

Q Would you tell the Court generally what that exhibit represents, in general terms?

A The base map is a colored map indicating property ownership in the vicinity of the Cappaert's property at Ash Meadows.

Q Could you tell the Court what these red squares are?

A The plastic overlay with the red squares on it indicates those sections that were delineated in the plaintiff's action.

MR. LIONEL: May the record reflect that Exhibit I consists of a map plus an overlay fitted directly over that map.

Q Now, in the center of each of those squares there is a number. What does that number represent?

A The number refers to the sectional subdivision of [249] land.

Q (By Mr. Lionel) I notice that some of these have a line drawn through them, and I think there's a line drawn through 26, 31, 32, 35, 24 and 19. Would you tell the Court what those represent?

A The overlay was prepared prior to the amendment that was filed with the Court on Monday. The red line through the number indicates those sections which were deleted in the amendment.

Q I notice that the number appearing in each of the squares is in black, except for the numbers "31" and "32" in the upper center on the right side.

What's the reason for those being in red?

A Those were added in the amendment on Monday.

Q Now, certain of the coloring here is in blue. Would you please explain to the Court what that represents?

A The blue color on the base map represents other privately owned lands in the vicinity of Ash Meadows, and is so indicated by the legend in the lower left-hand corner.



Q When you say "other privately-held lands," you mean lands which are not owned by the defendants Cappaert in this action?

A Correct.

Q Now, what is the land which is shown in green?

A The green is the fee lands that were held by the [250] Cappaerts and their precedessor owners in the area.

Q (By Mr. Lionel) Who were the original predecessor owners of the lands shown in green on Exhibit I?

A A number of individuals, including the State of Nevada.

Q And did you check the records to determine when the State of Nevada became the predecessor or owner of the lands shown in green on Exhibit I?

A I did.

Q And what did you do?

A I obtained copies of the State Selection List from the Bureau of Land Management offices at the State Headquarters in Reno.

Q And we have those here in Court; is that correct?

A That's correct.

Q Now, what is the land which is shown in yellow on Exhibit I, the land with yellow and a cross-hatch?

A The yellow lands with the cross-hatch represent those lands that were acquired by the patents from the Federal Government in 1969.

Q And we have that patent here in Court today, don't we?

A That is correct.

Q Now, there is also land here which is shown—

BY THE COURT: [251]

Q Excuse me, Mr. Lionel, I want to make sure I understand you.

Are any of the areas shown in green, or were they, acquired by patent from the United States directly?

A That is correct.

Q So the yellow is just to distinguish other lands from those acquired in 1969?

A The yellow distinguishes the land acquired by patent directly by the Cappaerts.

Q I don't understand the significance.

MR. LIONEL: Well, your Honor, we will show later on: The land that is in green, your Honor, was obtained by the State of Nevada from the Federal Government pursuant to a Federal Statute during the last century, and that the present defendants are successors in interest of that land.

The land which is in yellow was obtained by the defendants Cappaert in 1969 pursuant to the trade that Mr. Hillsamer testified concerning.

THE COURT: Oh, I see. All right.

You say the green area goes back that long?

MR. LIONEL: Last century, your Honor.

THE WITNESS: Nearly all of it.

BY THE COURT:

Q Some of it was a matter of state selection and then patents issued— [252]

A By the State.

Q —(By the Court) to the defendants or defendants' predecessors to the State of Nevada?

A Correct. There are a few patents directly from the Federal Government to predecessor owners.



THE COURT: Thank you. I understand.

MR. LIONEL: I stand corrected on that then.

Q What is the land shown in brown on I, the light brown color?

A The light brown color represents federal lands as does the darker brown, which is a hatch. The darker brown was what was proposed for this exchange.

Q In other words, the darker brown was part of what was proposed to be obtained as a result of an exchange between the Cappaerts and the United States, which did not go through?

A That is correct.

Q And the part which is yellow in cross-hatch was the part that was in fact exchanged?

A That is correct.

MR. LIONEL: At this time, your Honor, we'll offer I.

THE COURT: Mr. Lionel, the description you've just given of the various colors, does that appear on the map itself? [253]

MR. LIONEL: Yes, your Honor.

THE WITNESS: The legend is in the lower left corner.

THE COURT: All right. I can't see that.

MR. LIONEL: All there is on the overlay, if your Honor please, are the red squares with the numbers superimposed.

THE COURT: Do you have any questions on voir dire?

MR. GERMERAAD: Yes, I have a question.

VOIR DIRE EXAMINATION

BY MR. GERMERAAD:

Q You say the yellow cross-hatch was acquired by patent from the Government in 1969; is that correct?

A Right.

Q And what was the light brown?

A The light brown are other federal lands.

Q Federal lands. Then these other federal lands are not then, have not then acquired by the Cappaerts; is that correct?

A That is correct. They're still in the title of the Federal Government.

THE COURT: That's public domain.

Q (By the Court) But the darker brown is part of the original application for exchange; is that right? [254]

A Yes. It still, however, remains in the public domain.

THE COURT: Any objection?

MR. GERMERAAD: As long as the underlying documents on which this is based are introduced, I have no objection.

THE COURT: Very well, it will be received.

(Defendants' Exhibit I, having been previously marked for identification, is received in evidence.)

MR. GERMERAAD: He said he checked, and I would imagine that Mr. Lionel was going to have him introduce them.

MR. LIONEL: We intend to subsequently but not right now.

MR. GERMERAAD: Well, then, I have no objection, subject to those being supplied.

Q (By Mr. Lionel) Now, right here north of what is shown as "1" with the line through it, which was



one of the sections that had apparently been deleted by the amendment to the amended complaint, there is a dot and the words "Devil's Hole"; is that where Devil's Hole is?

A That's the location of the Monument; yes, sir.

Q Okay. Now, in this section, which has the number "7" superimposed on the overlay, we see certain things which have numbers, and I'm asking you if it's not true that [255] the following wells were here on the green fee portion in Section 7: Well No. 4, Well No. 2, Well No. 3, and I believe Well No. 1; is that correct?

A That is correct.

Q (By Mr. Lionel) Wells Numbers 16 and 17 are superimposed by No. 8 on the overlay, and those wells are in the land which was obtained in 1969 as a result of a trade with the Government; is that correct?

A That is true.

Q And Well No. 5 is where? Well, No. 5 is here also in that Section 7, and that is on land which was obtained in the exchange in 1969 from the Federal Government?

A Correct.

Q And so to summarize that, Wells Numbers 1, 2, 3 and 4 are in this area here in Section (indicating); and they are on lands which were fee lands previously obtained?

A True; correct.

Q And Wells Numbers 5, 16 and 17 are on lands which were located, on land which was obtained in 1969?

THE COURT: The previous testimony about leased lands, is leased land indicated on that chart?

THE WITNESS: No.

MR. LIONEL: Not at all, your Honor.

THE COURT: Not at all? [256]

THE WITNESS: No.

THE COURT: And I believe your previous testimony was that it was all developed on lands owned by the defendants?

MR. LIONEL: That's correct, your Honor.

THE COURT: Does that include what you call 16 and 17?

MR. LIONEL: That's correct, your Honor?

THE WITNESS: It also includes Well 6.

MR. LIONEL: Oh, that's right. I'm sorry. I forgot Well 6.

THE COURT: Five and six then?

MR. LIONEL: Yes, your Honor.

THE COURT: All right.

Q (By Mr. Lionel) Well, Wells 5, 6, 16 and 17 are all on lands which were obtained in the 1969 trade?

A No. 6 is on fee land.

Q I'm sorry, 6 is on fee land?

A Yes, sir.

Q This overlay isn't correct. 6 is on fee land, your Honor.

THE COURT: Section 3, isn't it?

MR. LIONEL: What's shown on 3 here, your Honor. (Indicating.)

THE WITNESS: Yes. [257]

Q (By Mr. Lionel) Now, on the fee lands on the map there are certain dates. Did you insert those dates on the map?

A I did.

Q And what do those dates represent?

A Those dates represent point in time at which title was transferred from the Federal Government to another entity.



MR. GERMERAAD: Excuse me, do you have an extra copy of this map?

MR. LIONEL: You may have that; yes.

(Defendants' Exhibit J, being aerial photographs, is marked for identification at this time.)

Q (By Mr. Lionel) Mr. Engstrom, as part of your duties with the defendants, did you do ground surveying?

A That is correct.

Q And Exhibit J, which consists of two sheets, do you know what they are?

A They represent reproduction of some aerial photography of the ranch properties.

Q And as I look at it—well, there are certain—superimposed on this exhibit are certain wordings, certain things marked in green and some marked in what might be a light orange—who did that?

A I did. [258]

Q (By Mr. Lionel) What does the green represent?

A The green represents cultivated lands.

Q This lower right-hand corner we're talking about is the southeastern portion; isn't that correct?

A That is correct.

Q And you say everything in green represents cultivated lands?

A Yes.

Q And that would be cultivated lands on the ranch owned by the defendants here?

A Yes; true.

Q And what does each box on here represent?

A That represents sectional subdivision of the lands.

Q When you say "sectional subdivision," how much are you talking about?

A The sectional subdivision refers to the one mile rectangular subdivision that breaks down by township, range and section.

Q Now, down here I notice in the southeastern portion, in the lower right-hand corner, you have some area—here we have two half sections in brown, which is Sections 12 and 7. (Indicating.)

What does that represent?

A That represents lands that were leveled prior [259] to the actual planting for cultivation.

Q (By Mr. Lionel) And do you know why they had not been cultivated?

A Because Well 5 has not been pumped since last September.

Q Since the commencement of this lawsuit; is that correct?

A That's correct.

Q Now, how about the land down here which is shown as Section 18, a portion here in Section 18? (Indicating.)

A The land in brown is also leveled—

THE COURT: What section, Mr. Lionel?

MR. LIONEL: 18 here in the lower right-hand corner, your Honor.

THE COURT: All right. I see.

A (Continuing) —that land is also leveled preparatory to cultivation.

Q (By Mr. Lionel) Now, where is Devil's Hole on this map? Would you come down and show his Honor, please?

A Surely. Devil's Hole is located in this position. (Indicating.) It's in Section 36. There's a red notation on the map that so indicates.



MR. LIONEL: May the record show, your Honor, that the witness pointed to a place here in Section 36 which is more or less on the western portion, generally [260] in the western portion on the right-hand side of the map.

Q (By Mr. Lionel) All right. That will be fine.

BY THE COURT:

Q Is there an area on the map pointing north? I don't see it. I assume the top is north?

A The top is north, that's true.

Q (By Mr. Lionel) Even though it doesn't show on the map here, Mr. Engstrom, could you show the Court the fee lands where Wells 1, 2, 3 and 4 are located?

A I would be the green in the right-hand edge of the lower portion along the strip of the green.

Q Would you come down here to the map and point that out to his Honor?

A Well 1 is located on fee lands at this point; Well 3 at this point; Well 2 in the same point as Well 4, in this location; Well 5 is on the level land at this point. Well 6 is at this location. (Indicating.)

They're all noted in red with a number signifying the number of the well. And then some five digit numbers which indicate the State of Nevada water permit number that applies to that point of diversion.

Q Okay. Mr. Engstrom, are you familiar with all the well permits with respect to this land?

A I am.

Q And these wells which we are talking about, 1, [261] 2, 3, 4, 5, 6, 16 and 17 have all been properly granted permits by the State Engineer?

A Wells 1, 2, 3, 4, 5, 6 and 17 have; 16 is still pending.

Q (By Mr. Lionel) 16 is still pending?

A That's correct.

Q 16 is not being used, is it?

A That's right.

Q And, in fact, hasn't been used except for the original test?

A That is true.

Q I show you what has been marked as Defendants' proposed Exhibits G-1 through G-26, inclusive, and ask you if you will now state what they are?

A Yes.

(Defendants' Exhibits G-1 thru G-26, inclusive, being State Selection List No. 8, are marked for identification at this time.)

Q What are they?

A They represent list No. 8 of the State Selection.

THE COURT: Represent what, sir?

THE WITNESS: Represent List No. 8 of the State Selection.

MR. GERMERAAD: Would it be okay, your Honor, if I just looked over his shoulder? [262]

THE COURT: Certainly.

Q (By Mr. Lionel) What do you mean by "State Selection"?

A They represent lands that were obtained by selection by the State of Nevada approximately March 12, 1890.

Q Obtained from whom?

A Federal Government.

Q Now, did you, in preparing Defendants' Exhibit I, use these State Selection instruments for the puropose of marking those properties on there, those fee properties?

A Which, the first one?



Q Yes, sir.

A Yes, sir.

MR. LIONEL: We're going to offer, your Honor, G-1 through G-26, inclusive.

THE COURT: Why don't we receive them subject to a motion to strike and you can check them later?

MR. GERMERAAD: That will be fine.

(Defendants' Exhibits G-1 to G-26, inclusive, having been previously marked for identification, are received in evidence.)

A I can point out the lands on each of those lists that are of specific reference there.

MR. LIONEL: Well, they'll have an opportunity [263] to do that.

A Okay.

THE COURT: These are Exhibits G-1 through 26?

THE CLERK: Yes, your Honor.

THE COURT: Inclusive?

THE CLERK: Yes, your Honor.

THE COURT: They'll be received subject to a motion to strike.

A (Continuing) Each of these lists contain a substantial acreage, and the lists have to be searched in order to locate the parcels we're concerned with.

Q (By Mr. Lionel) Isn't it true, Mr. Engstrom, that you have specifically marked where each of these parcels appear in that exhibit, and these other exhibits?

A That is true.

Q You put, I believe, is it, an orange mark next to it?

cel that is of interest.

THE COURT: This is the total state selection of that date then?

A Yes, there's an orange mark adjacent to the par-

THE WITNESS: That is correct.

THE COURT: You simply indicated those that are pertinent here? [264]

THE WITNESS: That is correct.

(Defendants' Exhibits F1 to F23, inclusive, marked for identification at this time.)

Q (By Mr. Lionel) Now, I show you what has been marked as Defendants' proposed Exhibits F1 to F23, inclusive.

THE COURT: What's that number again? What's that reference?

MR. LIONEL: F1 through 23, inclusive, your Honor.

A That is State Selection List No. 9.

Q And what was the year of those selections?

A It's December 2, 1890.

Q And did you use those in connection with the preparation of Defendants' Exhibit I, in the same fashion as List No. 8?

A Yes, sir.

Q Excluding the marking on those exhibits of the land which is involved here?

A That's correct.

MR. LIONEL: We'll offer, your Honor, Exhibits F1 through F23.

THE COURT: Same ruling.

MR. GERMERAAD: Thank you, your Honor.

(Defendants' Exhibits F1 thru F23, marked for identification as shown above, are received in evidence.) [265]

(Defendants' Exhibits D1 to D11, inclusive, marked for identification at this time.)



Q (By Mr. Lionel) I show you what has been marked for identification as Defendants' D1 to D11, inclusive, and ask you what that is?

THE COURT: I didn't hear you, D1—

MR. LIONEL: —through D11, your Honor.

THE COURT: —through D11?

MR. LIONEL: Yes, your Honor.

A This is State Selection List No. 11.

Q And did you use these in the same fashion as you have the prior exhibits?

A That is correct.

MR. LIONEL: We'll offer that, your Honor.

Q What's the date of that Selection List?

A April 12, 1890.

MR. LIONEL: May that be admitted, your Honor?

THE COURT: Yes, same ruling.

(Defendants' Exhibits D1 to D11, marked for identification as shown above, are received in evidence.)

Q (By Mr. Lionel) I show you what has been marked E1 to E13, inclusive, and ask you what that represents?

A State Selection List No. 10.

(Defendants' Exhibits E1 to E13, inclusive, marked for identification at this time.) [266]

Q (By Mr. Lionel) Was that used by you in the preparation of Defendants' Exhibit I?

A That is correct.

Q And were those state selections of fee land shown on there?

A Yes.

Q And what year was that selection?

A This is March of 1892.

MR. LIONEL: We offer, your Honor, E1 to E13, inclusive.

THE COURT: Same ruling.

(Defendants' Exhibits E1 to E13, inclusive, previously marked for identification, are received in evidence.)

Q (By Mr. Lionel) I show you what has been marked as Defendants' H1 to H6, inclusive, and ask you what that is?

A That's State Selection List No. 13.

(Defendants' Exhibits H1 to H6, inclusive, marked for identification at this time.)

Q Was that used by you in your preparation of Defendants' Exhibit I?

A That is correct.

Q What was the date of that selection by the State of Nevada?

A The date is October of 1892. The dates I've [267] recited are not the date of selection but the date of transmittal to the Governor, which is the date the title generally is considered to have passed.

Q (By Mr. Lionel) Why do you say "generally is considered"?

A Well, the original selection was made a couple of years prior to that.

THE COURT: Let's see, this is H1 through what?

MR. LIONEL: This is H1 through 6, your Honor.

THE COURT: This is State Selection No. 13, you say?

THE WITNESS: True.

THE COURT: It will be received subject to the same motion.

(Defendants' Exhibits H1 to H6, inclusive, previously marked for identification, are received in evidence.)



Q (By Mr. Lionel) I show you what is in evidence as Defendants' C-1, and ask you whether or not that is the patent used in showing the yellow cross-hatch land areas in Exhibit I?

A It is.

Q I show you what has been marked as Defendants' C-2 for identification, and ask you what that is? [268]

A It's a patent from the Federal Government on parcel of land consisting of two sheets covering land in Township 18 South Range 50 East, approximately 240 acres.

Q (By Mr. Lionel) Now, was that part of the land which you show in green as fee lands on Exhibit I?

A Yes, it is.

Q And what's the date of that?

A That's April 4, 1951.

Q I show you what has been marked as Defendants' proposed Exhibit C-3. Would you please state what that is?

THE COURT: What's the date of the patent in C-1, Mr. Lionel?

MR. LIONEL: This here, your Honor, is April 4, 1951.

THE WITNESS: It's the one held by the Clerk.

THE COURT: C-1?

MR. LIONEL: Excuse me, C-1? I'm sorry; that's 1969.

THE COURT: '69?

MR. LIONEL: This is October 14, 1969.

Q What is C-3?

A C-3 is a patent for a parcel of ground from the Federal Government to private ownership. It's dated January 4, 1923.

Q And this was used by you in preparation of the [269] green colored fee lands shown on Exhibit I?

A Yes, sir.

Q (By Mr. Lionel) And, in fact, Exhibit I will show that date, won't it?

A Yes.

Q I show you what has been marked Defendants' proposed Exhibit C-4, ad ask you what that is?

A Another patent for land from the Federal Government to private individual. It's dated December 12, 1916.

THE COURT: 1960?

THE WITNESS: 1916.

THE COURT: '16.

Q (By Mr. Lionel) And this is also shown on Exhibit I as part of the green fee lands, and Exhibit I shows the date of acquisition of this particular patent?

THE COURT: Of the green, did you say?

MR. LIONEL: I beg your pardon?

THE COURT: Of the green?

THE WITNESS: Yes.

MR. LIONEL: Yes.

Q I show you Defendants' proposed C-5. Please state what that is?

A It's another patent from the Federal Government to a private individual. It's dated July 23, 1931. [270]

Q (By Mr. Lionel) And is this shown on Exhibit I in the green portion?

A Yes, sir.

Q And it shows the date of this patent?

A Yes, sir.

THE COURT: Are these in evidence?



MR. LIONEL: No, your Honor. I'm going to offer them at one time.

Q C-6?

THE COURT: What color?

MR. LIONEL: In regard to—

THE COURT: In regard to C-5?

THE WITNESS: It's in green on the property map.

THE COURT: Part of the green; same as the others?

THE WITNESS: Yes.

Q (By Mr. Lionel) What is C-6?

A It's a patent from the Federal Government to a private individual. It's dated November 12, 1926.

Q And is that shown on Exhibit I in the green portion?

A Yes, sir; also contains the date.

Q C-7, what is that?

A It's another patent from the Federal Government [271] and it is dated November 20, 1928.

Q (By Mr. Lionel) And that's shown on Exhibit I in the green portion, and the date is shown on Exhibit I?

A Yes, sir.

Q What is C-8?

A C-8 is a patent from the Federal Government to a private individual. It's dated December 22, 1922.

Q Is that shown on the green portion on Exhibit I?

A Yes, sir.

Q And also has a date on Exhibit I?

A That is correct.

Q C-9?

A Is another patent from the Federal Government to a private individual, dated December 31, 1923.

Q Is that shown on Exhibit I in the green portion?

A Yes, sir.

Q And the date of this patent is shown in that particular place, the particular portion where this land is located?

A It is.

Q C-10?

A Is a patent for land from the Federal Government to a private individual. It's dated September 26, 1922.

Q Is that shown on Exhibit I in the green portion?

A It is. [272]

Q (By Mr. Lionel) And the date of the patent is shown where that land is located on Exhibit I?

A It is.

MR. LIONEL: At this time, if the Court please, we offer as Exhibits what has been marked from C-2 to C-10, inclusive.

THE COURT: We'll receive them subject to the Government's right to move to strike.

(Defendants' Exhibits C-2 to C-10, inclusive, previously marked for identification, are received in evidence.)

Q (By Mr. Lionel) Now, Mr. Engstrom, with respect to the green marked portion on Exhibit I, do the exhibits which have just been marked and introduced in evidence cover everything shown in green with the exception of one small portion?

A That is correct.

Q And is that the portion that I am showing in the lower left-hand corner, or rather, in the furthest southwest corner of Section 3?

A That's correct.

Q And that's a 40-acre piece; is that correct?

A That is true.



Q Is there any reason why you have no documentation with respect to that parcel?

A I was unable to locate such documentation. [273]

MR. LIONEL: Thank you.

THE COURT: In other words, these exhibits are documentation for all the areas in green with the exception of a 40-acre parcel—

THE WITNESS: In the southwest corner of Section 3.

THE COURT: —in the southwest corner of Section 3?

THE WITNESS: Yes.

Q (By Mr. Lionel) When we say "all the parcels" we're talking about all those which are encompassed by the overlay?

A Yes.

MR. LIONEL: We have not done anything about any portions which are not encompassed by the overlay.

THE COURT: I'm not sure I understand.

MR. LIONEL: Well, your Honor—

THE WITNESS: There are outlines on the overlay.

MR. LIONEL: —the overlay covers only those portions where the Government has originally sought to restrain the use of any water. And we haven't gone into any lands outside of that, your Honor. But it covers all of the green portions which were shown within that portion covered by the overlay. [274]

THE COURT: Are all of the green areas on that map, Exhibit I, involved in this litigation?

MR. LIONEL: No. Only those, your Honor, which are within these red squares.

THE COURT: Within the red squares.

MR. LIONEL: As your Honor will recall, the original ones encompass 31 and 32 here, 26 and 35 in 1/24/19, and they amended to take them out and then included new 31 and new 32.

But it covers, the exhibit now offered covered all of the green land within those sections. And everything within the lands where the Government seeks to enjoin defendants from using water.

THE COURT: Just the sections then in which wells are located the Government seeks to—

MR. LIONEL: No, your Honor; no. They haven't limited it to that. The Government's prayer, and what they're seeking in this preliminary injunction proceeding, is to enjoin the use of any pumping in any land within 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 sections of land. They have not even limited it to the present wells.

THE COURT: To the present wells? Okay.

MR. LIONEL: I have nothing further of the witness. [275]

THE COURT: Mr. Germeraad, you may cross-examine.

MR. LIONEL: If your Honor please, at this time I neglected to offer into evidence Exhibit J.

THE COURT: Do you have any objection to the large map?

MR. GERMERAAD: No, your Honor, unless we can discover something later, there is no objection.

THE COURT: It will be received.

(Defendants' Exhibit J. having been previously marked for identification, is rec'd. in evid.)



## CROSS-EXAMINATION

By John H. Germeraad, Esq., of Counsel for Plaintiff:

Q You mentioned several wells being located on fee lands shown in green. What about Well No. 13, where is that located?

A Well No. 13 is on federal land.

Q You were asked whether you were familiar with all these permits earlier, and these permit numbers are next to—

A They're on the photo map.

Q They're on the photo map?

A Yes, sir.

Q Are you familiar with an affidavit filed by the defendants by Mr. Westergard regarding those numbers, permit numbers? [276]

A I have not seen it; no.

Q (By Mr. Germeraad) Thank you.

MR. GERMERAAD: Do you have a clean copy?

MR. LIONEL: Of what?

MR. GERMERAAD: Of Mr. Westergard's affidavit?

THE COURT: It should be in the file.

MR. LIONEL: You didn't serve a copy.

Q (By Mr. Germeraad) Have you seen that, just generally, without looking at it, just looking at my notes?

A I have not seen it; no.

Q Are you familiar with the well permit numbers for each of those wells?

A Reasonably. I would have to refer to my files. We have 68 or 69 application permits in the area, so that for precise locations I would have to refer to my records.

Q Do you have those with you?

A Yes.

Q Could you refer to your records, and I will ask you questions regarding the permit—maybe you can just come up here to the map?

A All right.

Q And this will verify which permit numbers.

Now, are the permit numbers listed on this map?

A Just on the photo map. I might further explain that the only permit numbers that are indicated on this are those [277] that are currently being used,—

THE COURT REPORTER: Beg pardon?

THE WITNESS: Those that are currently being used by the ranch.

THE COURT: The permits that are being used by the defendants are on this exhibit, what is this number?—

THE WITNESS: Yes.

Q (By Mr. Germeraad) For only those that are presently being used, did you say?

A Yes.

THE COURT: What's the number of this exhibit?

THE CLERK: J, your Honor.

THE COURT: J.

Q (By Mr. Germeraad) Looking at Wells 1 through 6, 16 and 17, is there a permit listed there, Number 25556?

A Yes.

Q And what well is for that?

A 25556 is on an existing permit that is on a hole located in Section 12 in the southeast quarter. It is not presently in production. It is a dry hole.



BY THE COURT:

Q Does it have a number?

A 2555—

Q Not the permit number, the well number? [278]

A No, it has not been assigned a well number.

Q It's not on Government's Exhibit 3, that's why I'm asking.

Q (By Mr. Germeraad) Is there a permit number 25557?

A Yes; yes, sir. That represents—wait a minute, that represents another permit for a well located in Section 28 of Township 17 South Range 50 East. It's in the southeast quarter again. That hole has not yet been drilled.

Q Could you go to Well No. 1 and give me the permit number for that, please?

A Well No. 1 is permit number 25551 and 25560.

Q In whose name are those permits held?

A In Francis L. and Marilyn I. Cappaert.

Q Were these previously listed as in the name of Spring Meadows, Inc.?

A That is correct.

Q Do you have any idea when the change was made?

A From when?

Q From Spring Meadows, Inc. to the Cappaerts?

A The Cappaerts? I'd have to review my files to be certain of that date.

Q Would it have been in 1971 or 1972, 1970?

A It was the latter part of 1970 or early '71. [279]

Q (By Mr. Germeraad) Have you made yourself familiar with the protests filed by the National Park Service with the State Engineer concerning the permits?

A Which permits?

* * *

Q There was a series of permits that were granted on December 16, 1970, that totaled ten permits by the State Engineer. And I believe you testified at the hearing?

A Yes, I did.

THE COURT: December, 1970 did you say?

MR. GERMERAAD: December 16, 1970, your Honor.

Q Are you familiar with the protests filed on each of those permits?

A I haven't specifically reviewed them since that time; no.

Q But you were aware of them?

A Yes.

Q Have you become aware of the protests filed on the applications filed since that date?

A Yes.

Q When were you first aware of the protests filed by the National Park Service or other agency of the Federal [280] Government against the granting of permits by either Spring Meadows, Inc. or the Cappaerts?

A The first series were granted in December, 1970, and I became aware of it approximately October of that year when I was first retained to work for the ranch.

Q (By Mr. Germeraad) In that December hearing were the wells on which these permits were sought already in use?

A Yes.

Q What was the need for getting a permit?

A Generally it was either change of place of use or change of point of diversion.



Q When, if you know, did the drilling begin on Wells 16 and 17?

A That was the early part of this year. I couldn't give you the date.

Q But in 1972?

A Yes.

Q And Wells 16 and 17 then are on the land which you received from the Government in 1969?

A It was included in that land patented to the Cappaerts in 1969.

Q On Defendants' Exhibit J, all that in green is land that is irrigated?

A Yes. [281]

Q (By Mr. Germeraad) On which crops are being grown?

In the section just above Wells 16 and 17, it is not colored in, has that land been leveled, fenced, irrigated?

A No. It has been leveled, and at one time was irrigated; yes, sir.

Q Is that land owned by Spring Meadows or the Cappaerts?

A No, it is not.

Q And who does that land belong to?

A It's still in the public domain.

Q Are you familiar with the permit system that the State uses then to obtain water permits?

A Yes.

Q Do you have a record of the pumping history of each of the wells that Spring Meadows or the Cappaerts have drilled and produced?

A I have from time to time obtained copies of the records of information at the time by the Geological Survey in their studies.

Q But the Cappaerts or Spring Meadows, Inc. have no records of their own as to how much water was pumped?

A The project that the Geological Survey has undertaken has been a joint project, and they were obtaining the measurement data that we need for our purposes. [282]

Q (By Mr. Germeraad) In other words, you are relying on the Geological Survey to tell you how much water you were pumping?

A In total, yes.

Q Under the permit system to certify a beneficial use, do you not have to tell the State or verify to the State how much water you have pumped to perfect your permit?

A You have to tell them the quantity that you are using; yes.

Q If Spring Meadows, Inc. or Cappaerts do not or have not measured how much water they are using, do you know how they expect to perfect any of their permits with the State?

A I have made the necessary measurements on those applications for permits as to which approved beneficial use have been filed for the period I have worked for the ranch.

Q Have there been any perfected to that date?

A There have been.

Q Have any been perfected on the wells which are involved in this litigation, 1 through 6, 16 or 17?

A No.

MR. GERMERAAD: No further questions, your Honor. [283]



## REDIRECT EXAMINATION

BY MR. LIONEL:

Q Mr. Engstrom, what is the effect of the non-perfection of permits at this time of those wells?

A They are pending the proof of beneficial use of the water under Nevada's current permit system.

Q Is there anything improper about that?

A Nothing.

Q As a matter of fact, most of the permits for the State are in the same state, aren't they?

A A good number are; yes, sir.

Q Now, you're familiar with the statutes of the State of Nevada with respect to the use or beneficial use of water and the obtaining of those permits, aren't you?

A Reasonably, yes.

Q And are the Cappaerts, with respect to all these wells which we've discussed, in full compliance with that law, as you understand it?

A I believe they are; yes. [284]

* * *

## RECROSS-EXAMINATION

BY MR. GERMERAAD:

Q Go to this map please. Looking at Defendants' Exhibit J, and if you'll look at Well No. 1, please, is there a permit 25557 there?

A It is so noted; yes.

Q And if you look at Well No. 2, is there a permit 25562 there?

A Yes.

Q And Well No. 3, 25561?

A That is correct.

Q Well No. 4, 25564?

A Yes.

Q Well No. 5, 25559?

A Yes, sir.

Q And Well No. 17, 26446?

A Yes, sir.

MR. GERMERAAD: I would like to introduce these Exhibits, please.

THE CLERK: Plaintiff's Exhibits numbers 12 through 17, inclusive, are marked for identification.

(Plaintiff's Exhibits 12 through 17, being protests, are marked for identification at this time.) [285]

MR. GERMERAAD: You can take the witness stand.

Q You mentioned at one time that you were aware that protests had been filed by the Government on various well permits.

I asked you to identify permits on Wells 1, 2, 3, 4, 5 and 17.

Plaintiff's Exhibits 12, 13, 14, 15 and 16, would you identify these, please? Just tell the Court what they are.

A They're Xeroxed copies of protests that were filed with the State Engineer's office by a Gerard S. Witucki representing one of the federal agencies.

Q Okay. Did you at any time in your work concerning well permits for either Spring Meadows, Inc. or the Cappaerts—at this time I believe it was Spring Meadows, Inc.—see these permits prior to that hearing at which you testified?

A I know that I reviewed a number of protests. I presume that these are included in them; yes, sir.

MR. GERMERAAD: I would move for the admission of these documents, Plaintiff's Exhibits 12 through 16.



MR. LIONEL: If your Honor please, I'm going to object to them on several grounds; number one, they're not [286] properly authenticated; it's apparently a file copy, which has not been signed at all, or at least the notarization has not been taken; secondly, I don't think it has any relevancy in this proceeding. There were protests filed with respect—before the State Engineer of the State of Nevada—with respect to the applications for permits, and those permits were granted. And if they want judicial relief they could have gone into the Nevada State Courts and there could have sought judicial relief.

I don't know what relevancy the making of protests to those permits has in this proceeding.

MR. GERMERAAD: Your Honor, I will respond to that. Defendants, in their points and authorities, make some mention of estoppel. And in this light I'd like to bring out that at the time the defendants were seeking permits on these wells, they were well aware of the protests of the Federal Government to that.

I believe later on we will make our legal arguments, but this will show that we are certainly not sitting on our rights, your Honor.

THE COURT: You've asked the witness about Exhibits 12 through 16 for identification?

MR. GERMERAAD: Yes, your Honor.

THE COURT: And each one of those relate to a particular well, 1 through 5 and 17? [287]

MR. GERMERAAD: They relate to 1 through 5, your Honor, which was the subject of a hearing at which Mr. Westergard testified on December 16, 1970.

THE COURT: Well, in order to move the hearing along, I'll receive them subject to the objection noted Mr. Lionel.

(Plaintiff's Exhibits 12 thru 16 received in evidence.)

Q (By Mr. Germeraad) Have you also, sir, looked at or seen the protest subsequently filed on Well 17?

A I have.

Q Would the underlying two pages, the top of which is simply a cover letter, be that protest?

A I believe it is; yes.

MR. GERMERAAD: I move for the admission of Plaintiff's Exhibit 17.

MR. LIONEL: Same objection.

THE COURT: Same objection: same ruling.

(Plaintiff's Exhibit 17, previously marked for identification, is received in evidence.)

THE COURT: Mr. Germeraad, do I understand it then that protest No. 12 relates to the application for Well No. 1; 13 to 2; 14 to 3; 15 to 4; and 16 to 5; is that correct?

MR. GERMERAAD: No, your Honor.

THE COURT: Will you make that clear?

MR. GERMERAAD: Somewhat in different order. [288] Protest 25557—

THE COURT: Well, let's refer to it by the exhibit number.

MR. GERMERAAD: Plaintiff's Exhibit 12 relates to Well No. 1.

THE COURT: All right.

MR. GERMERAAD: Plaintiff's Exhibit 13 relates to Well No. 5; Plaintiff's Exhibit 14 relates to Well No. 3; Plaintiff's Exhibit 15 relates to Well No. 2; Plaintiff's Exhibit 16 relates to Well No. 4; and Plaintiff's Exhibit 17 relates to Well 17, your Honor.

THE COURT: Thank you.



Are—these being the Park Service protests you made reference to earlier?

MR. GERMERAAD: Yes, your Honor.

Q In 1970, December 16, when those hearings were held, you previously said that these permits were many times changed in point of diversion, and there was one other reason?

A Place of use.

Q Place of use. You said that they were also presently in use. Were they presently in use at the new places of diversion or places of use when you applied for the permits?

A That I really couldn't say. I was just newly acquainted with the project. [289]

* * *

ARLIE JOHN HILLSAMER

(a witness on behalf of the defendants, having been previously duly and regularly sworn, resumed the witness stand and testified as follows:)

* * *

CROSS-EXAMINATION (Cont'd.)

BY MR. GERMERAAD:

Q Mr. Hillsamer, I'm just going to have a very few questions for you—

THE COURT: Before you begin, I think the record should show that in view of the objection made Monday by Government counsel, that this witness has either expressly or implicitly brought out in his testimony that the questions answered by the witness were based upon records made and kept in the usual [290] course of business by the Bureau of Land Management and relied upon in the day-to-day business of that

agency and are therefore admissible under the Shop Book Rule.

Go ahead, sir.

Q (By Mr. Germeraad) I believe you said Monday that you first began dealings with Spring Meadows, Inc. in approximately 1966; is that correct?

A That's correct.

Q And that some of the individuals you dealt with have been Robert McDonald, Sam Brooks, Harold Hochmuth and Mrs. Mildred Johnson; is that correct?

A That's correct.

Q When they came to see you, what did you do? What did they ask for?

A They asked about the procedures, the procedural requirements, for effecting an exchange of land.

Q And you informed them of those procedures?

A I briefed them on the procedures.

Q At any time did you advise them what property should be offered as a basis for the trade?

A No, I did not. And I did refer them to our district manager here in Las Vegas to discuss this.

Q Okay. Did you handle any of the negotiations involved in this transaction?

A Not negotiations. [291]

Q (By Mr. Germeraad) Okay. Did you at any time make any representation as to the character of the land which they were trying to secure?

MR. LIONEL: Well, your Honor, I'm going to object to that. That calls for a conclusion of the witness.

THE COURT: Well, he's given conclusions heretofore. Overruled.

Your answer is "Yes?"

A I'm not sure—the federal land that they—



Q (By Mr. Germeraad) That they were seeking to get, did you make any representations?

A —were seeking to get, I made no representations as to the character of those lands.

Q At any time did you tell the people from Spring Meadows that if they got that land, they could drill for water on that land?

A No, this is—I did not.

Q Okay. That's fine.

Prior to the spring of 1968 when they began their procedures, what kind of forms did they have to fill out to execute or to begin the process to make an exchange?

A There is a standard form on which are identified the authority for the exchange and the identity of the applicant and the identity of the land applied for. [292]

Q (By Mr. Germeraad) Is there any place on that form that identifies what use the persons applying for the exchange want to make of the land?

A No, there's no provision for this.

Q Was there any requirement that Spring Meadows, the applicant, must tell you what they're going to use the land for?

A No, there's no requirement under this law that they indicate what they want to do with the land.

Q Was there a requirement under the Use Act requiring a notification or publication to various interested parties if the land exchange exceeded a certain size?

A Are you referring, sir, to the classification and Multiple Use Act of 1964?

THE COURT REPORTER: What is that again, sir?

THE WITNESS: The Classification and Multiple Use Act of 1964?

Q Yes, I believe that is—

A Yes; that law and the regulations thereunder require that any disposal action involving more, twenty-five hundred and sixty acres or more of federal land, that the proposed action be published, a notice be published in the Federal Register.

Q In the beginning of the Spring Meadows application did they break up proposals into separate units? [293]

A They did.

Q (By Mr. Germeraad) Did they break up the proposals into units of less than twenty-five hundred and sixty acres?

A Yes, they did.

Q Did you make any decisions involving this trade or exchange, I mean, as to its approval?

A I did not make any decisions as to the approval or disapproval of the exchange.

Q In the process that goes on in this exchange, are there various opportunities for interested parties to make protests of the action?

A There are.

Q Were there protests made to this action?

A Yes.

Q Was one of the protests filed by, I believe, Mr. Grant Sawyer?

A Yes; an attorney representing a client, a rancher in the area.

Q And he opposed this classification or exchange that was being asked for by Spring Meadows?

A Yes. Mr. Sawyer protested the classification proposal to the State Director and thereafter protested the classification to the Secretary of the Interior.



Q Just generally, were there other protests? [294]

A Yes, sir, there were.

Q (By Mr. Germeraad) Was a protest lodged by the United States Park Service?

A Yes, sir; a conditional protest.

Q Was Spring Meadows made aware of these protests?

A Yes.

Q Were they sent copies at various times of these protests or given written notification?

A They were given notification by certified mail of the pendency of the protests, the analysis of protests, and the disposition of the protests by the Secretary.

Q Since these protests occurred at various places along the line between probably what, 1967 or '68 and 1969, would that be the time?—

A I would have to refer to the file to be specific, sir; but this is substantially correct.

Q Be in the general time frame?

A The classification proposal issued, I believe, in 1970 or 1967, and I believe that the classification itself issued in 1968.

Q Since there were protests able to be lodged at various times through this procedure, was Spring Meadows, Inc. notified at different times of the procedures, and at more than one time at which the protests were made?

A Yes, they were made aware of what was transpiring. [295]

Q (By Mr. Germeraad) In the protests mentioned, made by the National Park Service, was the welfare of the pupfish mentioned?

A Yes.

Q Do Section 15 grazing permits allow irrigation for crops on federal land leased by the Government?

A Section 15 of the Taylor Act authorizes the issuance of leases of land rather than permits, and it would not include provision or authorization to irrigate land for farming.

Q On Monday Mr. Lionel asked a little bit about appraisals, and you made some remarks concerning those appraisals. Were those appraisals in the files which you brought to Court with you?

A They are not. [296]

* * *

Q (By Mr. Germeraad) On Monday Mr. Lionel had asked if he had ever seen your files, and your answer was "No"; is that correct? [297]

A Repeat that.

Q (By Mr. Germeraad) On Monday Mr. Lionel asked you whether he had ever seen your files. And your answer was "No"; is that correct?

A To the best of my knowledge he has not.

Q Has Mr. Engstrom gone through your files?

A Yes, he has.

MR. GERMERAAD: No further questions, your Honor.

REDIRECT EXAMINATION

BY MR. LIONEL:

Q Mr. Hillsamer, what land did the Government receive in exchange for this land that was patented to Spring Meadows, Inc.?

A Generally, sir, land in northeastern Humboldt County—do you require a specific legal description of this?



Q All right. Now, was this land which the Government received land which was needed by the Government in connection with a game refuge which it had?

A I can't answer you specifically. I think not in connection with a game refuge. I think it was acquired in connection with the ordinary range administration programs of the Bureau in the Winnemucca district.

Q Didn't the Bureau have some kind of a game refuge in which they wanted land so that when the birds would fly [298] into the refuge they would not have to fly over fee lands? Do you remember anything like that?

A I don't recall anything like that, sir.

Q (By Mr. Lionel) Okay. Now, counsel just asked you about protests that were made in conjunction with this application for the trade. Did you say there was no publication with respect to the proposed trade?

A There was publication made.

Q Where was publication made?

A In the Federal Register and in newspapers.

Q And, in fact, there were protests filed by numerous people?

A Not numerous people, Mr. Lionel. I recall the Park Service protest; the protest lodged by Mr. Sawyer for Mrs. *Druggs Bruecker* (phonetic); a protest lodged by—

Q Mr. Peterson?

A —Peterson; and a protest by a mining company.

Q Would that be the Nevada Non-Metalic Mining Company (phonetic)?

A Yes, sir.

Q Which was filed by Mr. Swink of Carson City?

A These are the only ones that I know about.

Q And was each of those protests considered?

A Yes.

Q And considered by whom? [299]

A Considered by first the district manager's staff people, and thereafter to the extent that they were sustained before the Secretary, they were considered by the Secretary's staff.

Q (By Mr. Lionel) I see. And that included a protest by the National Park Service?

A Yes, sir.

Q And that protest was on the ground that development of the area would increase water use, and would in turn lower the water level of Devil's Hole; isn't that correct?

A Yes, this is true.

Q And didn't the National Park Service say that—didn't they request that no land be classified so as to be available for this trade within one mile of Devil's Hole?

A That is correct.

Q And that protest filed by the National Park Service was in effect acceded to?

A That's correct.

Q In all respects?

A It was accommodated.

Q All right, now, do you have in your file, and did you bring with you pursuant to subpoena minutes of the Las Vegas District Advisory Board meeting of May 24, 1967?

A Yes, sir. [300]

Q (By Mr. Lionel) Do you have those, specifically the minutes of that day, May 24, 1967?

A Yes. I have that portion of those minutes that deals with this and a few other matters.



Here they are, sir.

Q I beg pardon?

A Here they are, sir.

Q You do have them?

A Yes.

Q Would you look at those, please? Perhaps we can save some time. Without pulling them out of your file, do those minutes reflect that on May 24, 1967, the Las Vegas District Advisory Board held a meeting at the Las Vegas BLM office?

A That's right, sir.

Q And does it also reflect that the proposed Ash Meadows exchange was considered?

A Yes, sir.

Q And do those minutes reflect that Spring Meadows, Inc. had purchased some five thousand acres of deeded land from George Swink, and with this additional land could develop the area for agricultural, livestock and residential homesites?

A Yes, sir.

Q At that time isn't it true that it was proposed [301] that there would be an exchange of 13,500 acres?

A I know that at that time this was—yes, sir, the minutes reflect this, 13,500.

Q (By Mr. Lionel) And do the minutes also reflect that the land that would be exchanged for this land would provide better management for the Winnemucca district of the Bureau of Land Management for livestock and recreation?

A Yes, sir; the minutes so reflect.

Q They so reflect?

A Sure do.

MR. LIONEL: Would you mark this as an exhibit?

THE CLERK: Defendants' Exhibit K marked for identification.

(Defendants' Exhibit K, being minutes of meeting, are marked for identification at this time.)

Q (By Mr. Lionel) Mr. Hillsamer, I show you what has been marked as Defendants' proposed Exhibit K, and I ask you if that is not a copy of the agenda and the minutes of the Las Vegas District Advisory Board meeting of May 24, 1967?

A Yes, sir. I prepared that as a Xerox copy.

MR. LIONEL: We offer that.

THE COURT: Any objection?

MR. GERMERAAD: Yes, your Honor, I do have [302] an objection.

VOIR DIRE EXAMINATION

BY MR. GERMERAAD:

Q Did you take these minutes, Mr. Hillsamer?

A No, I did not.

Q Were you at the meeting, Mr. Hillsamer?

A I was not.

MR. GERMERAAD: Then I object that there's no proper foundation.

BY THE COURT:

Q How did the minutes find their way in your file, sir?

A Quite honestly, your Honor, I don't know.

Q When the Advisory Board meets are the minutes normally a part of the file?

A Ordinarily, where there is a specific action by the board in connection with a title transaction such as



this, the district staff people would provide a copy for incorporation in the files so that the file reflects the response by the board to our query, routine query, for the board's views.

MR. GERMERAAD: Could I ask one more question?

Q Was there any decision made by the board at that meeting regarding Spring Meadows?

A There is nothing to indicate that the board made [303] a specific recommendation. There is indication, of course, that the matter was presented to the board.

Q (By Mr. Germeraad) Only that it was presented?

A Yes.

THE COURT: All right. The objection is overruled. The document will be received.

(Defendants' Exhibit K, having been previously marked for identification, is received in evidence.)

* * *

RECROSS-EXAMINATION

BY MR. GERMERAAD:

Q Mr. Hillsamer, what is the makeup of the Advisory Board?

A Well, this particular board is identified on the first page of these minutes. The Advisory Board generally are made up of elected representatives from the various grazing units.

And I should point out here that this was presented to the Advisory Board even though the lands involved are outside the organized grazing district. [304]

Q (By Mr. Germeraad) The Advisory Board is in itself advisory? It makes no decisions?

A It is advisory to the district manager, and I would enlarge upon the definition of the composition of the board. There is—the wildlife representative on the board is appointed.

Q And how many other representatives are there?

A I don't know, sir. I'll have to look at these minutes again and tell you.

Q Are there at least four then listed including the wildlife representative?

A There are more than four, sir, at best,—

Q In any case, most of the members, except for the wildlife representative—is the wildlife representative elected or is he appointed?

A The wildlife representative is appointed. The grazing representatives are elected.

Q So that other than the wildlife representative, the Advisory Board is made up of grazing representatives, in general?

A For the most part; yes, sir.

MR. GERMERAAD: No further questions.

THE COURT: Anything further, Mr. Lionel?

## REDIRECT EXAMINATION

BY MR. LIONEL: [305]

Q (By Mr. Lionel) As part of the Advisory Board there are also BLM personnel; is that correct?

A No, there are not BLM personnel on the board. The Advisory Board advises the manager.

Q But BLM personnel are frequently present; isn't that correct?

A Oh, yes, sir; yes, sir.

Q And I point out to you that in Exhibit K in evidence it states that present was Mr. Ross Ferris, the Range Specialist, NSO. Who is he?



A Well, he was a Nevada State Office—NSO—Nevada State Office Range Specialist in our division of Resource Management. He now has a similar job in the Washington Office of the Bureau.

Q And who is Dennis E. Hess, District Manager?

A He's the Las Vegas District Manager.

Q For the Bureau of Land Management?

A For the Bureau of Land Management.

Q And was on May 24, 1967?

A He was.

Q And who is Gene Nodine?

A Gene Nodine is presently our District Manager in Battle Mountain. He at that time was a staff man on the district staff here in Las Vegas.

Q After his name on the minutes it says "Range Manager." [306] What does that mean?

A Well, that is the title of his job on the district staff.

Q (By Mr. Lionel) How about Malcolm Charlton, Area Manager, Caliente and Virgin Valley Resources Areas, what is he?

A He, too, was a staff man working for Mr. Hess.

Q And is an employee of the Bureau of Land Management?

A Yes; as an area manager, he is the first-line general subordinate to the district manager.

Q And was the District Manager, Mr. Hess, at that time in charge of the area where Ash Meadows was and where this exchange was going to be effected?

A Yes, sir; yes, sir. The Section 15 lands, as we call them outside of the grazing district, are administered by the Las Vegas District Office.

Q And how about Mr. Philip Zieg, shown here as a Range Conservationist?

A Yes, sir; he's a staff man to Mr. Hess.

Q And also Mr. Robert E. Currier—

A I don't know about Mr. Currier. I think he was—

Q —shown here?

A —a district staff man at the time.

Q An employee of the Bureau of Land Management?

A Yes. [307]

Q (By Mr. Lionel) And all these men were vitally concerned with respect to this proposed exchange of lands? They were concerned?

A They were concerned.

Q It was within their field and within their specific purview?

A I don't know that all of them had the responsibility for that particular geographic area. I'm sure that some of those people may have been more vitally concerned with other geographic areas of the district.

Q But Mr. Dennis E. Hess was really the man that—

A Overall.

Q —had overall charge and supervision?

A That's correct, sir.

Q In fact, he was the number one man in charge of this particular area?

A That's correct, sir.

Q And most vitally concerned with the effect of this then proposed exchange?

A That's right.

MR. LIONEL: I have nothing further.



## RECROSS-EXAMINATION

BY MR. GERMERAAD:

Q While you've worked for the Bureau of Land Management, have you heard a lot of wild tales about the types [308] of development that people were going to propose?

A Yes, sir.

Q (By Mr. Germeraad) Have you heard so many that many times you just tune out the whole process?

MR. LIONEL: Well, if your Honor please, I'm going to object on the grounds it's not proper re-re-cross, and that it's irrelevant. The fact is, what happened in this case. That is the question.

MR. GERMERAAD: I'm simply showing, I think, what other BLM personnel, how they might approach persons who may lay out plans, whether they be realistic or unrealistic, your Honor. I think it's a proper question to ask.

THE COURT: I understand your point. Go ahead.

Q (By Mr. Germeraad) Do you understand the question?

A You asked me if I have heard wild tales from people about what they would do with federal land, and I said "Yes."

Q Do you put a whole lot of stock in everything that everyone tells you about their plans for development?

A No; obviously not.

MR. GERMERAAD: No questions, your Honor. [309]

## REDIRECT EXAMINATION

BY MR. LIONEL:

Q Mr. Hillsamer, you dealt here with numerous people, Mr. Hochmuth, Mr. Brooks, Mr. McDonald and Mildred Johnson; and I think Mr. Holzman, too; is that correct?

A Yes, sir, I do recall. I met Mr. Holzman, but this was early in the game, and only on one occasion.

Q Did you put stock in what these people told you they were going to do with this land?

A Well, it sounded reasonable.

Q Were you impressed with the integrity of these people and the fairness of their dealings?

A Yes, sir. But I must qualify that answer with this statement, that I was first approached by my oldest acquaintance in the State of Nevada, Bob McDonald, and I have a bias in his favor. I'm inclined to believe what he tells me.

Q But did you have any doubt as to what these other people told you?

A None.

Q Did they deal fairly at all times with the Government and with you, Mr. Hillsamer?

A To the best of my knowledge, they dealt fairly.

Q And do you know whether they went out and acquired this land in Humboldt County, which became part of this [310] exchange?

A Well, yes, obviously they did, because they offered it in exchange and gave us the—

Q (By Mr. Lionel) And do you know whether or not they acquired this land for the purpose of making the exchange?

A I believe that's what happened.



Q And, in fact, didn't they acquire approximately 12,000 acres rather than only half of that which was exchanged?

A I believe this is correct.

* * *

## BURNICE LEROY BARNETT,

(called as a witness on behalf of the defendants, being first duly sworn, testified as follows:) [311]

* * *

## DIRECT EXAMINATION

By Samuel S. Lionel, Esq., of Counsel for Defendants:

Q Where do you live, Mr. Barnett?

A On the property of Spring Meadows, Lathrop Wells, near Lathrop Wells.

Q Is that the property that's shown on this Exhibit J on here (indicating)?

A Yes, it is.

Q What's your occupation or profession, Mr. Barnett?

A Farm manager.

Q And for how many years have you been a farm manager?

A Since 1954; I've been in the farm occupation all my life, but in this type of work since 1954.

Q How old are you now, Mr. Barnett?

A Sixty-one.

Q And how long have you been the farm manager at Spring Meadows?

A Next February it will be five years.

Q And are you employed there by Mr. and Mrs. Cappaert?

A Yes, sir.

Q And were you previously employed by Spring [312] Meadows, Inc. before it dissolved?

A No; not previous to this five-year period.

Q (By Mr. Lionel) The five-year period you've worked up there for Mr. and Mrs. Cappaert?

A Yes.

Q I see. You have seen this Exhibit J before in my office; is that correct?

A Yes.

Q And you know what the lands shown, what the green markings on here represent, don't you?

A Yes.

Q What do they represent?

A Well, the green represents the land that we have under production now.

Q When you say "under production," what do you mean?

A I mean the land that has been cleared, leveled and being irrigated now and producing crops.

Q What kind of crops are being produced?

A Bermuda grass, alfalfa, wheat, barley.

Q When you first came to the ranch almost five years ago, how much of that ranch was in production being cultivated?

A Less than 100 acres.

Q How many acres are presently in cultivation?

A Approximately 4,000 acres. [313]

Q (By Mr. Lionel) Where is the best land on the ranch?

A In the contested area, in the Point of Rocks area; Sections 8, 7—in that area.

Q Are you talking down here in the lower right-hand corner of Exhibit J?

A Lower right-hand corner.



Q Which in effect would be the southeastern portion of the ranch?

A Right.

Q Now, I'm going to point to a certain green area here along the right side of the map, and ask you how that land compares with the rest of the land on the ranch?

A Well that in production today is superior to the balance of the property, other than small parcels of 40 or 50 acres—that entire area there is very productive at this point.

Q Do you have any cattle on the ranch?

A Yes.

Q How many head?

A I have approximately seventeen to eighteen hundred total, on the total ranch.

Q Now, in this place that you said which was the best area of the ranch now in the lower right-hand corner here, how many cattle do you have on that portion? [314]

A Approximately 500 head.

Q (By Mr. Lionel) Of what does that 500 head consist?

A That's mother cows with a calf by their side.

Q Is there any reason why they're in that portion of the ranch?

A Because it's my better pasture. I want these mothers to have the best pasture.

Q Now, are you familiar with all the wells that are on this property?

A Yes, I am.

Q What would happen if you had to shut down Wells Numbers 1, 2 and 17?

A Well—

Q You know where 1, 2 and 17 are?

A Yes. That would block out the use of that, all that valley area.

Q When you say "all that valley area," you mean —?

A That long green strip next to the southeastern boundary; yes.

Q Did you build a reservoir in this area?

A Yes. I built a reservoir at the upper end of that area.

Q Would you come down here and show the Court where that reservoir is? [315]

THE COURT: I believe that's turned back. I can't see what you're talking about.

A In this area here the dam goes across the botton, very bottom portion of Section 5.

THE COURT: Is there a section number in there so you can identify it for the record, Mr. Lionel?

MR. LIONEL: Yes.

THE WITNESS: It's the southwest one-quarter of Section 5.

Q (By Mr. Lionel) And when did you build that reservoir?

A 1970.

Q What did you build that reservoir for?

A To store water, rain water that would fall on the mountain areas around; also to protect the land from flood damage.

Q I see. And if you no longer had this land, were able to have well water for this land here that we've discussed that you said was your best land, would that reservoir serve any purpose?

A It would partially irrigate the land below. That land would be used for irrigation, that water would be used for irrigation.



Q Would it be adequate for those purposes?

A No, sir. [316]

MR. GERMERAAD: I didn't hear the answer, please.

THE WITNESS: No, it would not be adequate.

Q (By Mr. Lionel) How many people are employed on that ranch?

A To date there are 34 men on payroll.

Q How many men did you have on the payroll as of the end of last year?

A Eighty-one.

Q What is the reason that your payroll is down so much?

A Correction—the eighty-one was employed September 1; it was eighty-one prior to September 1. Then we cut back in September.

Q And why did you cut back?

A Because of our water troubles.

Q What were these men doing?

A Well, continuous protests of any well that we wanted to drill, not being able to get right-of-ways from BLM, all pertaining to this.

Q What do you mean "all pertaining to this"?

A Well, I mean just that, any move that we made was being protested by either Park Service, Interior Department—

Q Has there been any land which has been cleared [317] which you have not been able to irrigate because of the water problem?

A Yes, sir.

Q (By Mr. Lionel) Would that be the land which is shown here on the map in brown, in Sections 7 and 12?

A Yes, that's it.

Q And how about down here in Section 18 (indicating)?

A Well, that also is part of the same problem.

Q If you had water could you irrigate that land?

A Yes, sir.

Q If you're able to pump Wells 4, 5 and 6, would you have water for that?

A I would have water for the upper, the 160, four-forties to the—

Q In Sections 7 and 12?

A —there's a section or a—Well 5 is to water that land but it is stopped.

Q Well, how about down here, what would you use (indicating)?

A There is a problem of bringing water from Jackrabbit Spring into that area there, both right-of-way troubles and method of taking water from Jackrabbit.

Q How much do these wells cost to dig?

A We have in these wells that are being protested, we have $110,133.40 involved. [318]

Q (By Mr. Lionel) Now, did you build any cement ditches in this southeastern portion of the ranch for the purpose to be used in conjunction with your irrigation there?

A Yes. I built a mile and a half of cement ditch.

Q And what did that cost?

A $5,940.00.

Q Supposing you couldn't pump Wells Numbers 1, 2 and 17, would those ditches have any use at all?

A None.

Q Now, was there any underground pipe that was built in order to irrigate the southwestern portion of the ranch?

A There were two and one-half miles.



Q And how much did that cost?

A $33,096.71.

Q And supposing you couldn't pump water from Wells 1, 2 and 17 to that portion of the ranch, what would happen to that underground pipe?

A It would be a total loss.

Q Now, when were Wells 16 and 17 dug?

A Oh, I think that was in the month of December of this year, '72— I mean, month of January of this year.

Q And when did you start to pump Well 17?

A I believe it was the month of March, the latter part of March. I'm not positive.

Q And was there any reason why Wells 16 and 17 were [319] dug where they were dug?

A Well, the main reason was that based on the information that U.S.G.S. could give us, that we had the water there and that it was not involved with water connected with Devil's Hole.

Q (By Mr. Lionel) Is that what Mr. Dudley told you in September of nineteen hundred and—of last year?

A Well, words to that effect; yes.

Q All right. Do you know how much you paid for electricity used in the ranch during the year 1971?

A $52,500.00.

Q And to whom was that paid?

A R.E.A.

Q And supposing that you had to shut down these wells which the Government is now seeking to shut down, what would that do to your electric bill?

A Well, sir, it would cut probably fifty thousand dollars off of that.

Q Most of the electricity is used in connection with the pumping?

A Yes, sir, it is.

Q Now, when is the time of the year that you most need to pump these wells?

A There are eight months of the year. You have—March through October are the most important months. I'll [320] occasionally use a little water in those off months, but very little.

Q (By Mr. Lionel) Is right now one of the most important periods of the year?

A Yes, sir.

Q What would happen if you couldn't pump the wells which the Government is trying to stop you from pumping?

A Well, that area would have to be closed down.

Q When you say "that area," are you talking about all this green area here in the lower right-hand corner of the map?

A Yes, sir.

Q And that would mean all that you have planted there in effect would be lost?

A Right.

Q What's the relationship of this area here in the lower right-hand corner of the southeastern portion of the ranch as compared to the rest of it from the standpoint of value of the land and what it produces?

A Well, I consider this land nearer not peak production but nearer peak production, certainly more valuable at this point of our operation than any other part of the property.

Q Does it in fact carry the entire ranch?

A Yes, sir. It is the only land that is probably [321] paying a profit at this date.



Q (By Mr. Lionel) And the rest of it is not?

A It is not; no, sir.

Q Now, do you have much heavy equipment up there?

A Yes, sir, I have a lot of it.

Q What do you have?

A Well, mainly the caterpillar line. I have big 657 scrapers. I have two of those. They are 50-yard machines. I have four caterpillar dozers of different sizes. I have another crawler. I have two small, smaller, three smaller 12-yard carryalls to move dirt. They're Hancock. They're owned by John Deere. A lot of wheel tractors. And I have big heavy wheel tractors for moving up there.

Q What was this equipment for?

A Well, most of it, all but your small wheel tractors, was bought to clear this land and to complete this operation.

Q And approximately how much was spent for that equipment?

A Over half a million dollars.

Q And what's being done with that equipment now?

A It is parked. All the heavy stuff is not in use.

Q Why?

A Because we can't go forward until we're sure that [322] we're going to be able to complete this operation with, being able to get water, to drill more wells as needed.

* * *

## CROSS-EXAMINATION

By John H. Germeraad, of Counsel for Plaintiff.

Q You have been a ranch manager there five years next February?

A Right.

Q So as of now it's been four years and four months?

A Yes.

Q In 1967, approximately how many acres did you have under cultivation? Would it be about 300?

A 1967?

Q Yes.

A That was my first year there.

Q Yes.

A It was less than 100 at that time.

Q How about in 1968?

A I had approximately—just beginning, I had approximately—

Q Eight hundred by then, by the end of the season?

A Well, possibly so.

Q And how about 1969, by the end of the season how many did you have there? [323]

A '69, probably around 1,500, I would guess.

Q (By Mr. Germeraad) And maybe at the end of 1970 you hit 3,000?

A Yes.

Q And so then, as of now you have 4,000; is that correct?

A I have approximately 4,000 now.

Q When was the first time I met you, Mr. Barnett?

A The exact month and day I don't know. It was last summer.



Q And would it have been approximately September 2?

A Well, I think that would be close.

Q On that date you showed me around the ranch and showed me the entire operation, correct?

A That's right.

Q That day there were fields below the land which —let me go to the map—this is Well No. 5 at the top of the brown area?

A That is in fallow now; yes.

Q Yes; right. And this is Well 4 over here (indicating)?

A Right.

Q And this area is colored in green right there (indicating), correct?

A Right. [324]

Q (By Mr. Germeraad) On September 2 did you have tractors in the field preparing to put in barley at that location?

A I think the location you're talking about is one-quarter of a mile west of where you pointed out. Yes, I had tractors at work there preparing for it.

Q Is that area colored green?

A Beg pardon?

Q Is that area colored green on the map?

A Yes.

Q Were you notified of the stipulation which was entered into by the parties at the end of August last year, 1971?

A Yes.

Q Were you aware that under that stipulation Wells 4, 5 and 6 could continue to be pumped to salvage all existing crops until September 9?

A No, sir, I did not know that.

MR. GERMERAAD: I believe, your Honor, that is a matter of record in the case.

Q Did you, after my visit on September 7, use water to irrigate that section which you're putting in barley? You did put barley in there?

A Yes, I used water.

Q That is the reservoir which you pointed out to us, [325] which is north of some of your irrigated lands, and it's to the east of Devil's Hole; is that correct?

A Yes.

Q (By Mr. Germeraad) Does that reservoir leak, or have you had problems with it leaking, and it wouldn't hold up?

A I don't know. We've never had any rain to fill it.

Q Have you at times tried to get water to stay in there?

A I pumped a small amount at one time.

Q And that was built in 1970; is that correct?

A I believe that is correct.

Q Can you remember the first time when the Government asked or was seeking to have two of the wells shut down so that the water level in Devil's Hole would probably go back up? Would that have been in 1970 or 1971?

A Yes; that's right.

Q Is your employment on the ranch seasonal to some extent, that you will have more employees at one time than you will at another?

A Not in our operation. It's continual.

Q Would some of the manpower cutbacks that occurred in 1971 have been due to the efficiency of the concrete ditches? [326]



A Yes, that would be part of it.

Q (By Mr. Germeraad) You mentioned Jackrabbit Springs. Is Jackrabbit Springs on fee land owned by—

A No, that's on federal land owned by the Cappaerts.

Q That's on federal land?

A That's on federal land.

Q Have you in times past used water from Jackrabbit Springs on federal land?

A Yes, I have.

Q On occasion has the pump in Jackrabbit Springs been used to irrigate that land and pumped Jackrabbit Springs dry for all purposes?

A It didn't pump it dry because the flow was continual. My pump continued to pump at a rate of 1,000 gallons a minute out of it even though it was down.

Q It went down. Is Jackrabbit Springs another habitat of a different variety of pupfish?

A Well, I'm told now it is. I wasn't told that at the time the pump was in, I didn't know of any pupfish.

Q When exactly were these cement ditches put in?

A In January and February of 1972.

Q And when was the underground pipe put in?

A The underground pipe was put in, I believe, in 1969.

Q The pipe that takes the water from Well No. 1 and Well No. 17 over to the area next to Well No. 4, isn't there [327] a pipe that goes over there?

A Yes, there's a pipe goes from Well 4 in an L-shape going back toward Well 1, and from Well 1 going northward a half mile, and then going east again another half mile.

Q (By Mr. Germeraad) Was the pipe that goes from the well which earlier this year supplied water in the area of No. 4 Well, when was that underground pipe put in?

A In February of 1972.

Q And Wells 16 and 17 were put in in 1972; is that correct? You said January of this year?

A Yes; right.

Q So then, am I correct that the cement ditches, some of the underground piping and the new Wells 16 and 17 were all put in after this matter was already in litigation in this Court?

A Well, the well was put in at the time I told you, in 1972—this actual hearing here hadn't been called.

Q The suit was filed in 1971; is that correct?

MR. LIONEL: Object, your Honor; that's argumentative.

THE COURT: Ask him the date. The record speaks for itself.

Q (By Mr. Germeraad) When were you first aware that an action was filed against Spring Meadows and/or the Cappaerts? [328]

A This action here that we're having here today that you're talking about?

A (By Mr. Germeraad) Or the original complaint?

A Well, there was a complaint—

THE COURT: Counsel, don't go into what's in the file.

Ask him the date he put the wells in. Establish that factually. The record speaks for itself.

Q (By Mr. Germaraad) Did you make the decision to put in the cement ditches, Wells 16 and 17, and the



underground pipe that was put in then in this year at the beginning of 1972?

MR. LIONEL: Well, your Honor, I'm going to object to the form of the question. The underground pipe was put in in 1969, except in isolated instances, according to the witness's testimony.

MR. GERMERAAD: Right. I asked for part of the underground pipe. I didn't ask for all.

Q Did you make the decision to put these facilities in?

A Well, I made the decision. It wasn't necessarily made this year. The decision was made in the original plan of better methods of irrigation and conserving of water, was made when I first started. That's my plan on the whole operation. [329]

Q (By Mr. Germeraad) Have you ever irrigated for longer than eight months at a time?

A Well, I may have gone a little over, but eight months is the average figure for it, year in and year out.

Q Last year did you go into the month of December with some of your wells?

A It's possible; yes.

Q Are you an accountant, Mr. Barnett?

A No, sir.

A Do you keep records? How extensive are the records which you keep in your daily operation?

A Well, we keep, I feel, a very accurate set of records at our field office of our operation; not daily operation.

Q Earlier you said that certain southeastern portion of the ranch carries the entire ranch. Is this something that somebody has told you or do you know this from your personal knowledge?

A Nobody tells me anything about the operation. What I meant was that the income from that property helps to balance off the losses of the balance of the other property that is not near paying. I was speaking of income only.

Q Are you currently measuring the discharges of the wells at the Point of Rocks area?

A No. Our meters are not accurate. They're not [330] working. We at intervals asked Mr. Engstrom to check us out if we're in doubt of anything.

Q (By Mr. Germeraad) Then in this Point of Rocks area, this is where Wells 1 and 17 are, also, Well No. 2 I believe is in that area?

A Yes.

Q And this is the water that goes into some of the underground pipes?

A Right.

Q Are you aware that Spring Meadows Ranch has cooperated in a study with the Desert Research Institute?

A Yes.

Q On the area?

A Yes.

Q Have you seen the report of the Desert Research Institute?

A Not of any recent report. It may be in the office that I have some of the material I haven't had time to read.

Q Would you be surprised if the Desert Research Institute differed in its opinion of the value of the land in certain sections?

A Well, not surprised. We are proving quite a few surveys to be wrong in our production and what we can grow out there.



Q This machinery can be sold; can it not? [331]

A Well, I suppose there's a price on most used machinery.

Q (By Mr. Germeraad) On a per-acre basis, what is the carrying capacity of the past few years; if you know, in the southeastern area?

A It's running at this point very close to two cows to the acre. It's a cow and a half, actually, right now, but it will go to two here within thirty days.

Q Is that on the basis of more forage that's coming up?

A Yes, it's producing more forage than anything else we've got.

Q Does the quality of the water coming out of these different wells vary?

A Well, there's some variation. As a whole, all wells so far as salt, sodium, is very low. It's a very high quality water.

Q Is some of the water from some of the wells that which you might consider low quality water?

A No, sir; all wells are good.

Q Do you know whether the ranch has any records on the amount of water that has been pumped from any of the wells during any period of time that the ranch is operated?

A I know the bowl specification of every well there and, of course, we go by that figure, what the engineers have [332] designed each well to pump.

That's the only way I can give you gallons or acre-feet production over a period of time, I'll have to go back to my bowl specification. It balances out. A bowl will pump more in the spring of the year when the table is high than it is specified to do. But our specification is based on the bowl when it is drawn down to its low point.

Q (By Mr. Germeraad) Then during the year it's pumping, the water table then drops?

A That's right. It doesn't do all shelf pumping.

Q You mentioned that in September, 1971, you talked to Mr. Dudley. At this time were Wells 1, 2 and 3 still pumping?

A Definitely.

Q Did Dr. Dudley tell you that he thought you could drill wells in the area of 16 or 17, or did he tell you at that time that he didn't know where you could drill wells safer?

A He stated it was his opinion that the water supplying that area where those wells were was separate from that being supplied to Devil's Hole, and it was in his opinion that what we did in the way of pumping or drilling in that area would not affect the others. That was his opinion at that time.

BY THE COURT: [333]

Q Is that as to what wells, Mr. Barnett?

A Those wells in this—that's 1, 2, 3, 16 and 17. Well, 16 and 17 wasn't there at that time.

Q He did not say that about 4 then?

A Beg pardon?

Q He did not say that about Well 4 then; as you recall?

A No, I don't think he—no, he didn't say that about 4.

Q 1, 2, 3 and 17?

A Yes, 1, 2, 3—but no mention of 17 at that time. I hadn't drilled 17 at the time I talked to Mr. Dudley.

THE COURT: Go ahead, counsel.

Q (By Mr. Germeraad) Prior to the drilling of Wells 16 and 17, did you notify the Government that you were going to drill new wells?



A No, I did not.

Q Did you have a copy of the stipulation at the ranch?

MR. LIONEL: Well, your Honor, if we're going to try that proceeding, we might try the Assistant United States Attorney, because they brought this proceeding without giving us thirty days' notice as required by the stipulation. This is not a contempt proceeding, and that's why I'm objecting.

MR. GERMERAAD: I'm not asking that this in [334] any way be considered a contempt proceeding, and as for the views of Mr. Lionel, I'll handle that later in oral argument.

THE COURT: What is your question?

MR. GERMERAAD: Did he have a copy of the stipulation at the ranch since he was the ranch manager.

THE COURT: You can answer that.

A Yes, I have a copy of that.

Q (By Mr. Germeraad) Did you refer to it at any time during your operation or prior to drilling Wells 16 and 17?

A No, I did not.

MR. GERMERAAD: No further questions, your Honor.

## REDIRECT EXAMINATION

BY MR. LIONEL:

Q Mr. Barnett, Wells 16 and 17 were drilled where Dr. Dudley said he thought you would be able to drill without affecting the level of water in Devil's Hole; is that true?

A That's correct; it was in that area.

MR. LIONEL: Nothing further.

THE COURT: Thank you, Mr. Barnett.

MR. LIONEL: I have nothing further, your Honor, except I assume we can allude in argument to the affidavits of Richard F. Cowart and the State Engineer, [335] Ronald D. Westergard, which were submitted in conjunction with this matter.

THE COURT: That completes defendants' evidence?

MR. LIONEL: Yes.

THE COURT: Do the intervenors have any testimony to offer?

MR. PAUL: We have no evidence to offer, your Honor. We would like to participate in the argument, however.

THE COURT: Do you have any additional evidence in rebuttal on behalf of the Government?

MR. GERMERAAD: Yes. I would like to call a witness in rebuttal.

THE COURT: How long would that take?

MR. GERMERAAD: Three minutes.

THE COURT: All right.

MR. GERMERAAD: I'd like to recall Dr. Dudley.

WILLIAM W. DUDLEY, JR.

(recalled as a witness in behalf of the plaintiff, in rebuttal, being previously duly sworn, was further examined as follows:)

THE CLERK: The record will show that Dr. Dudley has previously been sworn, testified, and remains under oath.

DIRECT EXAMINATION

By John H. Germeraad, Esq., of Counsel for Plaintiff: [336]



Q (By Mr. Germeraad) Dr. Dudley, you've been in the courtroom this morning?

A That's correct.

Q And you've heard the testimony of Mr. Barnett, the ranch manager?

A That is correct.

Q Did you hear the testimony regarding a conversation supposedly with you in September of 1971?

A That's correct.

Q Do you remember that conversation?

A Yes.

Q Could you relate that conversation to us as you remember it, to the best of your ability?

A Yes. It began in the Point of Rocks area. And we began an informal discussion of the movement and availability of water in the area.

During this time I stated that I was not in any way authorized by either the Government or by the stipulation between the Government and the ranch to give permission to anyone to drill for water at any place, because it's not one of my functions.

I also stated that we had no evidence that there would be any effect from that area; but there might well be.

Q And that's the way you remember the testimony, you remember the conversation, to the best of your ability? [337]

A Yes.

MR. GERMERAAD: No further questions.

CROSS-EXAMINATION

By Samuel S. Lionel, Esq., of Counsel for Defendants:

Q Dr. Dudley, do you remember what you testified on this point the other day?

A I would imagine it's a matter of record.

Q Precisely. Do you remember saying that you may very well have told Mr. Holzman and Mr. Barnett that wells could be drilled in the area where 16 and 17 have since been drilled, and that in your opinion it would not affect the level of the water in Devil's Hole?

A I would imagine I said at the time, although I did not have a tape recorder of the conversation, I would imagine I said at the time that I had no evidence that they would have affected it. And this point was clarified in a telephone call—

Q Well, I didn't ask you that. I'm just talking about the conversation you had with Mr. Barnett and Mr. Holzman?

A Yes.

Q You say you told them at that time you had no evidence that any wells dug, 16 and 17, or were subsequently dug, would affect Devil's Hole; is that what you're saying?

A That is correct; and at that time I had that— [338]

Q (By Mr. Lionel) And did you tell them at that time you didn't think that drilling in that area would affect the level?

A I can not recall if I said it.

Q You could very well have?

A I suppose I might have. [339]

* * *



**7. Government's 1972 Exhibit 12, Protest Filed With the Nevada Engineer Re Well No. 1.**

In the Office of the State Engineer of the State of Nevada.

In the Matter of Application Number 25557, Filed by Spring Meadows, Inc., on April 21, 1970, to Appropriate the Waters of Underground source at a point located within the NE¼ SE¼ Section 28, T17S, R50E, MDB&M.

Protest of Application for permission to appropriate the public waters of the State of Nevada.

Comes now Gerard S. Witucki for the National Park Service Western Service Center, Water Resources Section, whose post-office address is 450 Golden Gate Ave., Box 36025, S.F., Calif. 94102, whose occupation is Chief, Water Resources Section, WSC, and protests the granting of application number 25557, filed on April 21, 1970 by Spring Meadows, Inc. Lathrop Wells, Nevada to appropriate the waters of Underground Source situated in Nye County, State of Nevada, for the following reasons and on the following grounds, to wit:

> Reference is given to the report, "Hydrogeology of the Devil's Hole area, Ash Meadows, Nevada," by G. William Fiero & G. B. Maxey; on the basis of the information presented in this report, it is indicated that further lowering of the water level in Devil's Hole, Ash Meadows, Nevada would result from the pumping of underground water in this area. This in effect would result in further threat of extinction to the already endangered native fishes of the genus Cyprinodon (Desert Pupfish) which inhabit Devil's Hole. In recent

months other springs in the area which provide the habitat for these native fishes have shown indications of marked decreased flow as a result of the pumping of the underground water sources. Should the subject application to appropriate water be approved, it can be expected that grave consequences to the ecology of this area will result. On the basis of this information, the National Park Service must protest the appropriation of any additional public waters from underground sources in the Ash Meadows-Devil's Hole area.

Wherefore protestant prays that the application be denied and that the use of water herein claimed by protestant be confirmed and that an order be entered establishing said right and for such other relief as the State Engineer deems just and proper.

/s/ Gerard S. Witucki
Gerard S. Witucki
Protestant.

State of Nevada, County of Nye—ss.

....., being first duly sworn, deposes and says, that he has read the foregoing protest and knows the contents thereof and that the same is true of his own knowledge, except as to the matters which are therein stated on information and belief, and as to those matters he believes it to be true.

Subscribed and sworn to before me this 10th day of August 1970.

/s/ S. Douglas
S. Douglas
Deputy Clerk
Deputy Clerk, U.S. District Court
Northern District of California



**8. Government's 1972 Exhibit 13, Protest Filed With the Nevada Engineer Re Well No. 5.**

In the Office of the State Engineer of the State of Nevada.

In the Matter of Application Number 25559, Filed by Spring Meadows, Inc., on April 21, 1970, to Appropriate the Waters of Underground Source at a Point Located Within the NW¼, NW¼, Section 7, T18S, R51S, MDB&M

Protest of Application for permission to appropriate the public waters of the State of Nevada.

Comes now Gerard S. Witucki for the National Park Service Western Service Center, Water Resources Section whose post-office address is 450 Golden Gate Ave., Box 36025, S.F., Calif. 94102 whose occupation is Chief, Water Resources Section, WSC, and protests the granting of application number 25559, filed on April 21, 1970 by Spring Meadows, Inc., Lathrop Wells, Nevada to appropriate the waters of Underground Source situated in Nye County, State of Nevada, for the following reasons and on the following grounds, to wit:

Reference is given to the report, "Hydrogeology of the Devil's Hole area, Ash Meadows, Nevada," by G. William Fiero & G. B. Maxey; on the basis of the information presented in this report, it is indicated that further lowering of the water level in Devil's Hole, Ash Meadows, Nevada would result from the pumping of underground water in this area. This in effect would result in further threat of extinction to the already endangered native fishes of the genus Cyprinodon (Desert Pupfish) which inhabit Devil's Hole. In recent months other springs in the area which provide the habitat

for these native fishes have shown indications of marked decreased flow as a result of the pumping of the underground water sources. Should the subject application to appropriate water be approved, it can be expected that grave consequences to the ecology of this area will result. On the basis of this information, the National Park Service must protest the appropriation of any additional public waters from underground sources in the Ash Meadows-Devil's Hole area.

Wherefore protestant prays that the application be denied and that the use of water herein claimed by protestant be confirmed and that an order be entered establishing said right and for such other relief as the State Engineer deems just and proper.

/s/ Gerard S. Witucki
Gerard S. Witucki
Protestant

State of Nevada, County of .....—ss.

....., being first duly sworn, deposes and says, that he has read the foregoing protest and knows the contents thereof and that the same is true of his own knowledge, except as to the matters which are therein stated on information and belief, and as to those matters he believes it to be true.

Subscribed and sworn to before me this 20th day of July, 1970.

/s/ S. Douglas
S. Douglas
Deputy Clerk, U.S. District Court
Northern District of California



**9. Government's 1972 Exhibit 14, Protest Filed With the Nevada Engineer Re Well No. 3.**

In the Office of the State Engineer of the State of Nevada.

In the Matter of Application Number 25561, Filed by Spring Meadows, Inc., on April 21, 1970, to Appropriate the Waters of Underground Source at a Point Located Within the NE¼, SE¼, Section 7, T18S, R51E, MDB&M.

Protest of Application for permission to appropriate the public water of the State of Nevada.

Comes now Gerard S. Witucki for the National Park Service, Western Service Center, Water Resources Section, whose post-office address is 450 Golden Gate Ave., Box 36025, S.F., Calif. 94102 whose occupation is Chief, Water Resources Section, WSC, and protests the granting of application number 25561, filed on April 21, 1970 by Spring Meadows, Inc. Lathrop Wells, Nevada to appropriate the waters of Underground Source situated in Nye County, State of Nevada, for the following reasons and on the following grounds, to wit:

Reference is given to the report, "Hydrology of the Devil's Hole area, Ash Meadows, Nevada," by G. William Fiero & G. B. Maxey; on the basis of the information presented in this report, it is indicated that further lowering of the water level in Devil's Hole, Ash Meadows, Nevada would result from the pumping of underground water in this area. This in effect would result in further threat of extinction to the already endangered native fishes of the genus Cyprinodon (Desert Pupfish) which inhabit Devil's Hole. In recent months other

springs in the area which provide the habitat for these native fishes have shown indications of marked decreased flow as a result of the pumping of the underground water sources. Should the subject application to appropriate water be approved it can be expected that grave consequences to the ecology of this area will result. On the basis of this information, the National Park Service must protest the appropriation of any additional public waters from underground sources in the Ash Meadows-Devil's Hole area.

Wherefore protestant prays that the application be denied and that the use of water herein claimed by protestant be confirmed and that an order be entered establishing said right and for such other relief as the State Engineer deems just and proper.

/s/ Gerard S. Witucki
Gerard S. Witucki
Protestant.

State of Nevada, County of .....—ss.

....., being first duly sworn, deposes and says, that he has read the foregoing protest and knows the contents thereof and that the same is true of his own knowledge, except as to the matters which are therein stated on information and belief, and as to those matters he believes it to be true.
Subscribed and sworn to before me this 20th day of July, 1970.

/s/ S. Douglas
S. Douglas
Deputy Clerk, U.S. District Court
Northern District of California



**10. Government's 1972 Exhibit 15, Protest Filed With the Nevada Engineer Re Well No. 2.**

In the Office of the State Engineer of the State of Nevada.

In the Matter of Application Number 25562, Filed by Spring Meadows, Inc., on April 21, 1970, to Appropriate the Waters of Underground source at a point located within the NE¼, SE¼ Section 7, T18S, R51E, MDB&M.

Protest of Application for permission to appropriate the public waters of the State of Nevada.

Comes now Gerard S. Witucki for the National Park Service Western Service Center, Water Resources Section whose post-office address is 450 Golden Gate Ave., Box 36025, S.F., Calif. 94102 whose occupation is Chief, Water Resources Section, WSC, and protests the granting of application number 25562, filed on April 21, 1970 by Spring Meadows, Inc., Lathrop Wells, Nevada to appropriate the waters of Underground Source situated in Nye County, State of Nevada, for the following reasons and on the following grounds, to wit:

Reference is given to the report, "Hydrology of the Devil's Hole area, Ash Meadows, Nevada", by G. William Fiero & G. B. Maxey; on the basis of the information presented in this report, it is indicated that further lowering of the water level in Devil's Hole, Ash Meadows, Nevada would result from the pumping of underground water in this area. This in effect would result in further threat of extinction to the already endangered native fishes of the genus Cyprinodon (Desert Pupfish) which inhabit Devil's Hole. In recent months other

springs in the area which provide the habitat for these native fishes have shown indications of marked decreased flow as a result of the pumping of the underground water sources. Should the subject application to appropriate water be approved it can be expected that grave consequences to the ecology of this area will result. On the basis of this information, the National Park Service must protest the appropriation of any additional public waters from underground sources in the Ash Meadows-Devil's Hole area.

Wherefore protestant prays that the application be denied and that the use of water herein claimed by protestant be confirmed and that an order be entered establishing said right and for such other relief as the State Engineer deems just and proper.

/s/ Gerard S. Witucki
Gerard S. Witucki
Protestant.

State of Nevada, County of .....—ss.

....., being first duly sworn, deposes and says, that he has read the foregoing protest and knows the contents thereof and that the same is true of his own knowledge, except as to the matters which are therein stated on information and belief, and as to those matters he believes it to be true.

Subscribed and sworn to before me this 20th day of July, 1970.

S. Douglas
/s/ S. Douglas
Deputy Clerk, U.S. District Court
Northern District of California



**11. Government's 1972 Exhibit 16, Protest Filed With the Nevada Engineer Re Well No. 4.**

In the Office of the State Engineer of the State of Nevada.

In the Matter of Application Number 25564, filed by Spring Meadows, Inc., on April 21, 1970, to appropriate the waters of underground source at a point located within the NE¼, SW¼, Section 7, T18S, R51E, MDB&M.

Protest of Application for permission to appropriate the public waters of the State of Nevada.

Comes now Gerard S. Witucki for the National Park Service Western Service Center, Water Resources Section, whose post-office address is 450 Golden Gate Ave., Box 36025, S.F., Calif. 94102 whose occupation is Chief, Water Resources Section, WSC, and protests the granting of application number 25564, filed on April 21, 1970 by Spring Meadows, Inc., Lathrop Wells, Nevada to appropriate the waters of Underground Source situated in Nye County, State of Nevada, for the following reasons and on the following grounds, to wit:

Reference is given to the report, "Hydrogeology of the Devil's Hole area, Ash Meadows, Nevada," by G. William Fiero & G. B. Maxey; on the basis of the information presented in this report, it is indicated that further lowering of the water level in Devil's Hole, Ash Meadows, Nevada would result from the pumping of underground water in this area. This in effect would result in further threat of extinction to the already endangered native fishes of the genus Cyprinodon (Desert Pupfish) which inhabit Devil's Hole. In recent months other

springs in the area which provide the habitat for these native fishes have shown indications of marked decreased flow as a result of the pumping of the underground water sources. Should the subject application to appropriate water be approved it can be expected that grave consequences to the ecology of this area will result. On the basis of this information, the National Park Service must protest the appropriation of any additional public waters from underground sources in the Ash Meadows-Devil's Hole area.

Wherefore protestant prays that the application be denied and that the use of water herein claimed by protestant be confirmed and that an order be entered establishing said right and for such other relief as the State Engineer deems just and proper.

/s/ Gerard S. Witucki
Gerard S. Witucki
Protestant.

State of Nevada, County of .....—ss.

....., being first duly sworn, deposes and says, that he has read the foregoing protest and knows the contents thereof and that the same is true of his own knowledge, except as to the matters which are therein stated on information and belief, and as to those matters he believes it to be true.

Subscribed and sworn to before me this 20th day of July, 1970.

S. Douglas
Deputy Clerk, U.S. District Court
Northern District of California



**12. Government's 1972 Exhibit 17, Protest Filed With the Nevada Engineer Re Well No. 17.**

In the office of the State Engineer of the State of Nevada.

In the Matter of Application Number 26446, filed by Cappaert Enterprises, on December 21, 1971, to appropriate the waters of underground source at the new point of diversion located within the NW¼ SW¼ SEC.8 T18S, R51E MD B&M.

Protest of Application for Permission to Change the place of use and manner of use of a portion of the public waters of the state of Nevada.

Comes now Gerard S. Witucki for the National Park Service/Interior, Western Region, Water Resources (ASW) whose post-office address is P.O. Box 36063, San Francisco, California 94102 whose occupation is Chief, Water Resources, and protests the granting of application number 26446, filed on December 21, 1971 by Cappaert Enterprises, Vicksburg, Mississippi to appropriate the waters of Underground Source situated in Nye County, State of Nevada, for the following reasons and on the following grounds, to wit:

Reference is given to the report, "Hydrogeology of the Devil's Hole area, Ash Meadows, Nevada," by William Fiero & G. B. Maxey; on the basis of the information presented in this report, it is indicated that further lowering of the water level in Devil's Hole, Ash Meadows, Nevada, would result from the pumping of underground water in this area. This has been largely substantiated by the recent monitoring of this water level by the U.S. Geological Survey. This in effect would result in further threat of extinction to the already endangered native fishes of the genus Cyprinodon (Desert Pupfish) which inhabit Devil's Hole. In

recent months, other springs in the area which provide the habitat for these native fishes have shown indications of marked decreased flow as a result of the pumping of the underground water sources. Should the subject application to appropriate water be approved, it can be expected that grave consequences to the ecology of this area will result. On the basis of this information, the National Park Service must protest the appropriation of any additional public waters from underground sources in the Ash Meadows-Devil's Hole area.

WHEREFORE protestant prays that the application be Denied and that the use of water herein claimed by protestant be confirmed and that an order be entered establishing said right and for such other relief as the State Engineer deems just and proper.

/s/ Gerard S. Witucki
Protestant.

State of California, County of San Francisco—ss.

Gerard S. Witucki, being first duly sworn, deposes and says, that he had read the foregoing protest and knows the contents thereof and that the same is true of his own knowledge, except as to the matters which are therein stated on information and belief, and as to those matters he believes it to be true.

/s/ Gerard S. Witucki

Subscribed and sworn to before me this 11th day of February 1971.

S. Douglas
/s/ S. Douglas
Deputy Clerk, U.S. District Court
Northern District of California



**13. Reporter's Transcript of Proceedings Had Before the State Engineer, December 16, 1970.**

In the Matter of Spring Meadows, Inc., Applicant. Application Nos. 25556, 25557, 25558, 25559, 25561, 25562, 25564, 25571, 25581, 25662.

Reporter's transcript of proceedings had before the State Engineer, held in the County Commission Chambers, Courthouse, Las Vegas, Nevada, on Wednesday, December 16, 1970, at 9:00 o'clock a.m.

APPEARANCES:

State Engineer: Mr. Roland D. Westergard.

For the Applicant: Thomas R. C. Wilson, II., Esq. McDonald, Carano, Wilson & Bergin, 60 Court Street, Reno, Nevada.

For the Protestant U. S. Department of Interior: Otto Aho, Esq., Field Solicitor, United States Department of the Interior, Room 2004, Federal Building, 300 Booth Street, Reno, Nevada.

LAS VEGAS, NEVADA, WEDNESDAY,
DECEMBER 16, 1970:

MR. WESTERGARD: This is the time and place, after due notice, for the hearing in the matter of certain applications filed by Spring Meadows, Inc., specifically by numbers these applications to appropriate water are: 25556, 25557, 25558, 25559, 25561, 25562, 25564, 25571, 25581 and 25662.

The hearing is reported today and we do appreciate him filling in, certainly the last minute, because of the difficulty in the weather conditions in Reno, the scheduled Reporter was not here. The Reporter now will be sworn.

(Thereupon the Court Reporter was duly sworn.)

MR. WESTERGARD: The two parties appearing are Spring Meadows, Inc., and the National Park Service. We also have on file a protest by Michele Enterprises, Ltd. Is that firm represented today?

(No response.)

MR. WESTERGARD: The record will indicate that they are not.

Will the attorneys for the parties state their appearances, please?

MR. AHO: I am representing the Protestant, the National Park Service of the United States Department of Interior. My name is Otto Aho, Field Solicitor, Room 2004 Federal Building, United States Courthouse, 300 Booth Street, Reno, Nevada 89502.[3]

MR. WILSON: I am Thomas R. C. Wilson, 60 Court Street, Reno, Nevada, counsel for the Applicant Spring Meadows, Inc.

MR. WESTERGARD: As far as payment for the cost of the transcript of the hearing, the State will require an original and one copy and after a determination of the cost it will be split between the two parties.

MR. AHO: When the cost has been determined and split between the two parties, I will ask that the bill for the payment of the record be presented to the National Park Service, United States Department of Interior, Western Service Center, 540 Golden Gate Avenue, Box 36125, San Francisco, California, 94102, and I will stipulate that the government is to share equally in the cost.

With respect to copies of the transcript, I hope to hear from the interested agencies within a matter of a week and if any copies of the transcript are required



I will ask the agencies to make their request directly to the Reporter for the copies.

MR. WESTERGARD: I think it would be in order to briefly describe the ten applications and the protests thereto under consideration here today.

The numbers in order are No. 25556, the Applicant is Spring Meadows, Inc., the water is from an underground source in the amount of 6.0 second feet to be used for irrigation and domestic and it is used for the irrigation of [4] 960 acres. The point of diversion is the northwest quarter of the southeast quarter, section 12, Township 18 South, Range 50 East, M.D.B. &M., and the place of use—rather than detail this into the record, this will be considered a part of the record by reference.

Application No. 25557, the source also is underground, the amount 6.0 second feet for irrigation and domestic, for irrigation of 600 acres. The point of diversion is described as the Northeast Quarter, Southeast Quarter, Section 28, Township 17 South, Range 50 East, M.D.B.&M.

No. 25558, the source is underground, amount 6.0 second feet, use, irrigation and domestic on 1400 acres. Point of diversion to be Northeast Quarter of the Northeast Quarter of Section 6, Township 18 South, Range 51 east, M.C.B.&M.

25559, source underground, amount 6.0 second feet, use irrigation and domestic for irrigation of 1320 acres. The point of diversion is the Northwest Quarter of the Northwest Quarter, Section 7, Township 18 South, Range 51 East, M.D.B.&M.

No. 25561, source underground; amount 6.0 second feet for irrigation and domestic on 1,040 acres; diver-

sion point is Northeast Quarter of the Southeast Quarter of Section 7, Township 18 South, Range 51 East, M.D. B.&M.

No. 25562, source underground, amount 6.0 second feet, for irrigation and domestic for irrigation of 1,040 [5] acres, source of diversion Northeast Quarter of Southeast Quarter of Section 7, Township 18 South, Range 51 East, M.D.B.&M.

No. 25564, source is underground, amount is 6.0 second feet, use for irrigation and domestic for 1,080 acres: Diversion Northeast Quarter of Southwest Quarter of Section 7, Township 18 South, Range 51 East, M.D. B.&M.

No. 25571, source is Pointed Rock Springs, amount is 3.0 second feet for irrigation and domestic, 1,040 acres, diversion point Southeast Quarter of the Northwest Quarter of Section 7, Township 18 South, Range 51 East, M.D.B.&M.

No. 25581, source is underground, 3.0 second feet to be used for stock and domestic purposes, 5,000 cattle. Point of diversion Northeast Quarter of the Northeast Quarter of Section 11, Township 18 South, Range 50 East, M.D.B.&M.

No. 25662, source is underground, amount 3.0 second feet to be used for recreation and domestic, point of diversion is the Northeast Quarter of the Northeast Quarter of Section 6, Township 18 South, Range 51 East, M.D.B.&M.

Now, I have on file a protest of the applications by the National Park Service and grounds of the protest are as follows, and I quote:

"Reference is given to the report, 'hydro-geology of the Devil's Hole area, Ash Meadows, Nevada,' by



G. William Fiaro and G. B. Maxey; on the basis of the information [6] presented in this report, it is indicated that further lowering of the water level in Devil's Hole, Ash Meadows, Nevada, would result from the pumping of underground water in this area. This in effect would result in further threat of extinction to the already endangered native fishes of the genus, Cyprinodon (desert pupfish) which inhabit Devil's Hole. In recent months, other springs in the area which provide the habitat for these native fishes have shown indications of marked decreased flow as a result of the pumping of the underground water sources. Should the subject application to appropriate water be approved, it can be expected that grave consequences to the ecology of this area will result.

"On the basis of this information the National Park Service must protest the appropriation of any additional public waters from underground sources in the Ash Meadows—Devil's Hole area.

"Wherefore, Protestant prays that the application be denied and that the use of water herein claimed by Protestant be confirmed and that an order be entered establishing said rights and for such other relief as the State Engineer deems just and proper."

There was also a protest filed against Application No. 25571 by the Michele Enterprises, Ltd. The grounds for protest are as follows, and I quote:

"The source is fully appropriate, as would infringe [7] on existing rights owned by the Protestant or its predecessors in interest, and that it would be detrimental to the public welfare."

They pray that the application be denied.

With this background material in the record, we will proceed. It is customary, and I have not heard objections, that the Protestant proceed first, then the Applicant proceeds.

MR. AHO: May I inquire, may we refer to the basin that is involved here generally as the Ash Meadow basin?

MR. WESTERGARD: For the purpose of this testimony, this would be fine.

MR. AHO: The United States Department of the Interior requests that the Nevada State Engineer either reject outright the pending water applications of Spring Meadows, Inc., or postpone further action thereon pending the completion of certain studies presently being made of the water basin within which the pending applications pertain, namely, the Ash Meadows basin.

The U.S. Department of the Interior requests the alternative actions because of the real threat to the continued existence of the pupfish in the area created by the present withdrawals of water in the area and which threat, in all probability, would be maximized by the approval by the State Engineer of any further water applications in the area.

The pupfish found in the Ash Meadows area represent [8] the remains of large fish populations which inhabited the ancient lakes of the Southwest following the last Ice Age. The ancestors of the pupfish became isolated more than 20,000 years ago when the extensive lake system of the Death Valley region began to dry up and recede. In the isolated pool in Devil's Hole in the Ash Meadows Basin and in the other springs in the area these isolated fish populations evolved rapidly



into unique species which are highly adaptive to the ecological conditions in their hot water environment. Scientists believe that these species represent an enormous research potential in the area of genetics and evolutionary change and deserve the degree of protection which has been given the Everglades alligator and the whooping crane.

Devil's Hole is a natural pool of water about 10 feet in width and 40 feet in length in the Ash Meadows Basin. The water surface is approximately 50 feet below the surface of the surrounding landscape. The pool extends deep into the caverns of the carbonate rock structure where it is believed to be interconnected with the regional ground-water system. In 1952, President Truman issued a Presidential Proclamation adding the 40 acres containing Devil's Hole to the Death Valley National Monument. The Proclamation recognized the unique scientific value of the Devil's Hole pupfish and stated that the subterranean pool in Devil's Hole is "of such outstanding scientific importance that it should be given special [9] protection." The "peculiar race of desert fish" was cited by the President as a primary reason for protecting Devil's Hole.

The world's entire population of the Devil's Hole pupfish, the Cyprinodon diabolis, dwells in the confines of the warm pool in Devil's Hole. Other species of pupfish are limited in their distribution to certain shallow springs in the general area of Devil's Hole and the Ash Meadows Basin. These diminutive fish, because of their restricted distribution and numbers, are recognized as endangered species and are on the list of endangered species of the United States promulgated by the Secretary of the Interior under the provisions of the Rare

and Endangered Species Act of 1965, 16 U.S.C. 668aa.

During the summer of 1969 the water level in Devil's Hole began to drop drastically. A Continuous water level recorder, maintained by the U. S. Geological Survey, indicated that by October of 1969 the water level was approximately 10 inches lower than the May, 1969, level. During the winter months of 1969-70 there was a recovery of approximately only three inches before the level began to drop again in the spring of 1970. In early November, the hydrograph showed that another ten-inch drop in the water level had occurred during the summer of 1970. At that time, the water level was approximately 18 inches lower than it had been at any time [10] since the recorder was first placed in Devil's Hole in 1956. The water level had declined so rapidly that large portions of a shallow rock shelf which had been covered by the water in May, 1970, were now exposed.

The existence of the Devil's Hole pupfish population depends upon maintaining the water level above the submerged rock shelf, for it is upon this shelf that the entire population feeds and reproduces. The shelf is 10 feet wide and 18 feet long. Beyond the shelf the water drops precipitously into a cavern more than 284 feet deep. Sun rays that stimulate growth of algae strike the water surface and the submerged shelf for only brief periods during summer days. During the winter months little, if any, direct sunlight reaches the shelf. The amount of food produced on the shelf controls the size of the pupfish population. The rapid decline in the water level at Devil's Hole prompted the National Park Service to install an artificial shelf below the water's surface. The Park Service believes that at best the



shelf should be considered merely a temporary remedy as it is inconsistent with the natural environment of Devil's Hole. Biologists report that the extinction of the pupfish in Devil's Hole may be imminent if the decline in the water level therein is not reversed.

Large scale ground water withdrawals have been made and will be made in the Ash Meadows area, principally by [11] Spring Meadows, Inc. Spring Meadows, Inc., has drilled over 30 wells in the area. At least 8 of these wells have been utilized for irrigation purposes. Most of these wells are within a three-mile radius of Devil's Hole.

Although several studies of the ground water conditions in the Ash Meadows region have been made, it appears that the exact nature of the hydrological structure is not fully understood.

Hydrologists know that the ground water in the Ash Meadows area occurs principally in two subterranean regions—the surface alluvial system and the underlying carbonate rock system.

The alluvial system is composed of deposits from Pleistocene lakes a swell as debris which has been eroded from surrounding mountains. These deposits have been estimated to vary in thickness from 1,000 to 5,000 feet thick. Drilling logs and information from the Nevada State Engineer's Office indicates that the irrigation wells drilled by Spring Meadows, Inc., are located within the alluvial layer.

Underlying the valley fill is a layer of carbonate rock composed primarily of gray limestone. Hydrologists are of the apparent opinion that the springs in Ash Meadows and Devil's Hole are associated with the ground water contained in this structure. Two factors

which bear out this theory are: one, the high temperature of the water, which indicates [12] extreme depth; and, two, the water chemistry. The water temperature in Devil's Hole has been determined to be 92 degrees, which indicates a deep source. There appears to be little, if any, doubt that direct pumping from wells reach directly into the carbonate aquifer.

Since the heavy pumping is occurring from the alluvial fill and Devil's Hole is connected with the carbonate rock aquifer, the crucial factor is the relationship which exists between these two water systems. The extent to which the two flow systems are interconnected appears to have been determined only in general terms. Deep wells in the area which penetrate the carbonate rock aquifer have higher heads than do nearby wells which are located in the alluvium. This suggests an upward flow pattern from the lower layer where conditions permit.

Hydrologists theorize that the fault in the Ash Meadows region provides an opportunity for the water in the carbonate rock aquifer to escape into the alluvium.

A test which would support this hypothesis occurred in 1967. A well was drilled into the alluvium about 900 feet northeast of Crystal Spring, which is located two miles from Devil's Hole. After three hours of heavy pumping, the flow from Crystal Spring was reduced by 175 gallons per minute. The water pumped was found to have a similar temperature and chemistry to that in Crystal Spring and the carbonate rock [13] aquifer, thus indicating a common source. A similar well was drilled into the alluvium 900 feet east of Devil's Hole and was pumped for less than three hours. Although no



decline was noted in the water level in Devil's Hole, the temperature and chemistry of the water level prompted Dr. G. B. Maxey, a hydrologist, to conclude that it was "undoubtedly drawn from the same carbonate aquifer" as Devil's Hole.

Dr. Maxey is associated with the Center for Water Resources Research, Desert Research Institute, University of Nevada System, Reno. The Center for Water Resources Research was requested by the Department of the Interior to conduct a hydrologic study of the Devil's Hole area. A report thereon, entitled "Hydrogeology of the Devil's Hole Area, Ash Meadows, Nevada," was published by the Center in June, 1970—a copy of which was furnished to the Nevada State Engineer. In its "Summary," the report alludes to the large-scale, ground water withdrawal by pumping by Spring Meadows, Inc., and states then that:

> "The relationship of the time of maximum pumping to the periods of water level decline in Devil's Hole shows a high degree of correlation. Continued heavy ground water withdrawal by pumping will cause a continued decline in pool level in Devil's Hole and a reduction of [14] discharge from the major springs in the Ash Meadows area."

Hydrologists with the United States Geological Survey are of the same opinion, one of whom has stated that: "A hydrologist would be hard pressed to explain that such a decline in water levels is the result of anything other than pumping."

The U. S. Department of the Interior has funded a water supply study of the Ash Meadows region to be made by the U. S. Geological Survey. The work is

underway with the cooperation of Spring Meadows, Inc. The study is designed to provide a large volume of data in the shortest period of time possible. The study is aimed specifically at clarifying the relationship between water withdrawals and the existing water structure underlying the area, as well as determining the annual recharge of the system. The need for this information has been well demonstrated.

A second project is presently being planned by the Interior Department which will allow the Desert Research Institute to take the information collected by the Geological Survey and prepare predictive models for use in the management of the water resources in the Ash Meadows basin. Factors relating to the feasibility of augmenting present ground water resources with surface storage and distribution facilities, artificial recharge, and water importation will be evaluated also in the Desert Research Institute project. [15]

In addition to these two projects, the Bureau of Reclamation will soon initiate an investigation to determine the feasibility of developing the ground water resources of Amargosa Valley for present and projected agricultural, municipal and industrial use. Detailed studies would be conducted thereunder to determine more accurately the amount of ground water recharge to the valley fill and the amount of ground water that can be withdrawn economically. Extensive exploration of geohydrology will be made to prove the extent of the ground water basin and it will be ascertained if pumping from the alluvial source will endanger the springs in the Ash Meadows area, and/or the pupfish population, in any way.

It is well recognized by the hydrologists that the aquifer of the Ash Meadows Basin is an extremely



complex one. The key to the survival of the pupfish is the understanding of the complexities of the underground water system in the Ash Meadows Basin and the use of these waters by man. The technical data necessary for the understanding of the complexities of this underground water system is inadequate at the present time. The previously mentioned studies of the U.S. Department of the Interior and the Desert Research Institute will furnish this required information.

These studies are being undertaken to benefit all parties concerned, viz.: The Federal Government with its primary concern for the continued existence of the pupfish and [16] the preservation of Devil's Hole; the State Government with its concern for the continued existence of the pupfish because of its jurisdiction over fishes within its boundaries and because of its concern for the most effective and economical use of the waters in the State; and Spring Meadows, Inc., with its concern for a continuous and dependable water supply. These studies will develop the needed additional information on the serious water supply problem in the Ash Meadows area. These studies will clarify the water supply as it relates to Devil's Hole, will provide the needed information for the management of the water resources in the Ash Meadows area, and will be useful in the development of a water supply management plan for the Ash Meadows area, consistent with environmental interests.

The present annual large withdrawals of water in the Ash Meadows Basin pose a real and serious threat to the continued existence of the pupfish in Devil's Hole and the other pupfish in the area and these large withdrawals may, in fact, exceed the annual recharge of the water in the Basin with its dire consequences to

the entire underground water supply in the Basin. The approval of the pending applications of Spring Meadows, Inc., and any other applications, to appropriate water in this Basin would only increase manyfold the present dangers to the existence of the pupfish and the underground water supply in the Ash Meadows Basin. [17]

The U. S. Department of the Interior recommends most strongly to the Nevada State Engineer that he reject outright the pending applications of Spring Meadows, Inc., and any other pending applications, or postpone any action thereon until the previously mentioned studies are completed and analyzed.

That concludes my statement. Thank you.

MR. WILSON: A point of inquiry, is this statement that was read, is it the Engineer's position that the factual statements presented in the body of this report are to be accepted as evidence on the part of the Protestant, or are they like any statement, if they are not evidence of the facts, they are not considered. For example, on page six and seven there are certain—and in other parts of the statement, there are in effect accounts of statements made by other parties of source, hydrological and geological conclusions with respect to the effect the granting of these applications would have on the subject Basin.

MR. AHO: It is my request that those statements are to be taken as evidence of the fact. You do have copies of Dr. Maxey's report and you also have, of course, your own information in your own office to which I referred, the well drilling logs, and you also are well aware that the United States Geological—the individual's name escapes me for the moment—is



working closely with your office in a water study, [18] and I think all of the information to date which I have alluded to in my report is available and in reports in your own office, if I am not mistaken.

MR. WILSON: This material is a matter of record, that is right; but my point being there should be an opportunity to question the material that is presented here, at least to explore it in detail; that is my feeling, at least as far as this hearing is concerned.

MR. WESTERGARD: Well, the statement, of course, that was presented will be included in the record and the reports that are mentioned will also be evaluated.

In other words, the reports mentioned in the statement will be a part of the record.

MR. AHO: If I may make a further statement, I would like to state for the record that these reports tend mostly to indicate the need for further studies. These reports indicate that the precise data is not available at the present time and that is why we are urging most strongly that you withhold action until the other reports are completed which will be of a highly technical and acceptable nature.

MR. WILSON: I had another inquiry and that is, also, to inquire, insofar as the Engineer's knowledge and records are concerned referred to in the statement appearing on page 10 which asserts that these large withdrawals may, in fact, exceed the annual recharge of the water in the Basin with its [19] dire consequences to the entire underground water supply in the Basin. It is my general understanding that the actual withdrawal of water at the present time is within and does not exceed the annual recharge, if my understanding is correct.

MR. WESTERGARD: This material is not of record in this hearing, Mr. Wilson, but there is a certain amount of information on this report, the State Engineer's report, and that has been and will be considered.

MR. WILSON: Now, with respect to the factual situation regarding the use of water exceeding the annual recharge, should we have witnesses for that or do the words "may, in fact, exceed the annual recharge—" The point of my inquiry is to ask, as a factual matter, whether or not the use of water at the present time, so far as your information is concerned, does in fact exceed the annual recharge or whether the use of water at this time is within the annual recharge. Mr. Aho's statements says "may", and I am simply raising that question.

MR. AHO: The reason this statement was made is for the purpose of future withdrawals, it is not whether the present withdrawal does in fact exceed or did ever exceed the annual recharge, but further applications may exceed that recharge and that is the primary purpose of the study that is being made at the present time.

MR. WILSON: Well, I am going to waive my opening [20] statement except to make an observation that it is our rather general understanding that with the total appropriation of water by Spring Meadows, Inc., and other users of water does not exceed and is within the perennial recharge of the annual yield. Now, I appreciate there has not been any evidence offered, except for the statement offered by Mr. Aho, Counsel for the Government, but the position is clear that it is our understanding and our position, based upon the information that we have—



MR. WESTERGARD: Well, you may proceed, Mr. Wilson, if you desire. [21]

* * *

MR. WILSON: Well, I assume that Protestant will make his statement first.

MR. AHO: Well, all right.

I believe that the evidence presented here this morning and available to the State Engineer from matters which are of record in his office indicate quite clearly, there is inadequate information available at the present time, to allow any more applications in this basin. As a matter of fact, although the Department of Interior has received wholehearted cooperation from Spring Meadows, Inc., we had to do quite a bit of arging, I understand, to finally get the meters installed on the wells in order to get accurate records.

As Mr. Barnett pointed out this morning, those meters were not installed until last month, November, 1970. At the present time only a few of those wells are pumping from which you can gather data. Now, from the meters that are on the non-pumping wells you are not getting any data from them.

In view of the fact that there is insufficient information available at this time on the Ash Meadows Basin, on behalf of the Protestant, the National Park Service, we urge the State Engineer most strongly to at least defer action on the applications until this information is brought in to [66] him so that he can make a proper decision on these applications and rather than leaving the matter open for an indefinite time, and I may be sticking my neck out as far as the Interior Department is concerned, but I would also recommend that the State Engineer put a time limit upon or within which

the Interior Department may make presentation of the information for the use by the State Engineer to make that decision. I would recommend that he give the Protestant, the Interior Department, until January 1, 1972, to supply this information, and I would recommend that the State Engineer advise the Department that unless that information is delivered to him by January 1, 1972, he would be inclined to make whatever decision appears fit to him.

Thank you.

MR. WILSON: If the Chair please, I don't want to make a long statement but this, I suppose, is a rather classic case in which the Protestant comes before the Engineer and says, "We want to protest but we have not established and don't have the grounds upon which we can protest and we would like some more time to develop that ground. If we don't, fine, then you can grant the application justified on the basis of the presently existing study which has been proposed."

We would ask that the applications be granted and if I may digress for just a minute, this is a classic case of a landowner who came in to the area and made substantial [67] investment back in 1966 and 1967 who had the encouragement of the government and made his investment and has developed the land and has converted that development into a valuable economic asset for this State and for this particular County, a substantial ranching operation.

Along the way it was discovered that there resides in that range a species of fish which may or may not be affected by the pumping of water that is necessary for the completion of the agricultural project. This is not a case of a landowner coming in despite the



national asset and developing in spite of the harm it might inflict, this is a case of a landowner develops his property and then suddenly finds that his ranching operation may ultimately be in conflict with the water supply in the habitat of those fish.

The Department of the Interior as late as November, 1968, was encouraging and promoting agricultural development in the Amargosa Valley. They put out an interim report of the inland basin projects, Amargosa Project, Nevada-California, November, 1968, and talking about the feasibility and potential agricultural development in that valley, and parenthetically speaking, the report concerns the management, conservation of the water, development of the water supply and the development of agricultural and industrial areas.

That, mind you, was in 1968 whereas the government now is talking about a monument that was established in 1952 [68] about which it wants to assert a water right of sorts for the preservation of a fish habitat.

The government reached various conclusions in the course of its report and one appears on page six where it cites the value to the local economic situation, growth, and tax base of a portion of Southern Nevada. It goes on even further and states on page six that in order to develop the potential projects it may be necessary to revise the existing State ground water laws to permit the granting of more water for the project in this area. Now, that is the formal view of the Department of Interior at this time, long after the establishment of the pupfish monument.

Now, it talks further about the annual recharge, on page 39, of the Amargosa Valley and it makes a statement that there is about 24,000 acre feet per year

and the report contains a letter from a Department of Interior official, Bureau of Sports Fisheries, which is dated June 6, which is found in that particular report at page 46, and it discusses the possible benefits or lack of benefits to the wildlife in the area.

MR. AHO: What is the date of that letter?

MR. WILSON: June 6th.

MR. AHO: What year.

MR. WILSON: 1967.

This letters states, "We are concerned with the [69] possible effects of the projects on the desert bighorn sheep which are present in the nearby Death Valley Monument. These sheep are dependent upon the natural springs and seeps for their drinking water. If any of these sources of drinking water dry up due to the lowering of the water table related to pumping of irrigation water for the project, artificial watering devices should be provided to compensate for the loss of natural drinking water sources of the sheep."

"There would be no benefits associated with fish."

Now, there I don't know if they refer to the species of pupfish or not, but at this time they do not seem to be worried about the effect of the withdrawal of water in that area.

The point of this is simply to emphasize that apparently there seems to be a rather lately-discovered problem in which a rancher has come in and made an investment in hopes of making an economic contribution to the State and along the way it was discovered that we are involved with a biological phenomena, Cyprinodon diabolis, and that those fish may become endangered. The government, evidently, did not know



about this or, if it did, it ignored it, and, or at least part of the government and at this time let me say parenthetically that those agencies of the federal government here in Nevada and the State agencies which have been involved have offered Spring Meadows every cooperation and have been [70] frank in all of their dealings with Spring Meadows, Inc., for which they have got a great deal of appreciation from Spring Meadows.

The problem appears to be that we cannot bring the Interior Department, at least as it sits in Washington, D.C., to the table to sit down and try to resolve this problem. The first pupfish symposium which Spring Meadows participated in on this problem was last May, 1970, and there was a frank discussion of the problem and on June 23, 1970, the Desert Research Institute submitted a proposal to try and define what that problem is and try to find which wells may or may not effect Devil's Hole.

Now, it is generally recognized that it is not a hydrogeological problem, so to speak, it is a hydrological problem because we are dealing with the reduction of the static water level. When we view the extremely small fluctuation at Devil's Hole and its material and relevant cause, the biological circumstances at Devil's Hole itself, the fluctuations of the water level at Devil's Hole and so forth, we can't even say that the pumping generally is the cause to any degree for those fluctuations, simply because there has been pumping of water by Spring Meadows, and I submit that the total use of water in the Amargosa-Ash Meadows sub-Basins are within the perennial yield or the perennial recharge. So the problem is not caused by the use of water, it is a problem, really apart [71] from

the water and if the government is to say that we insist upon maintaining the static water level in Devil's Hole it is going to mean that those people who own water rights in the basin are not going to be able to use them, not because their use of the water is interfering with the traditional government's water rights but that because that water in Devil's Hole is going to fluctuate to some degree and will have some biological consequence, if not hydrological consequence, and that is a different kind of ball game.

Now, the complainant is not the representative of the Department of Interior in the State or even in the region, it is the Department of Interior in Washington, D.C. On June 23rd of 1970, the Desert Research Institute submitted a proposal, after conferring with Spring Meadows, to put together some kind of a program, in cooperation with Spring Meadows and to supply the pertinent material to try to find out which wells might be responsible and to discover the biological effects of these minor fluctuations.

Back on July 11th, the Desert Research Institute made a proposal dated June 23rd and a series of rather specific steps were proposed. These involved the collection of data referred to today, the installation of parshal flumes and meters on each well and try to get some kind of a program underway immediately to get some information immediately and asked Spring Meadows to voluntarily modify its well program [72] and convert its irrigation system plans so they would be more completely able to study the biological effect on Devil's Hole. The only reply that was received was the acknowledgment of the receipt of the letter and that the statement was made that the government was going to use the United States Geological Survey to make



the study, but in an effort to get things moving, Spring Meadows, Inc., went ahead and on July 3, bought the meters, with their own money bought the meters, and placed these meters on the wells.

On July 10th the parshal flumes were received and Spring Meadows then went ahead and installed them. These things have been installed over a period of time and with the help of Spring Meadows, but for quite a period of time that equipment was stored, but the parshal flumes and gauges are now installed and the last of the meters were installed finally, last month.

Desert Research Institute submitted another proposal, I think in October, and that is the one that is under consideration today. We are not adverse to the conduct of studies, but frankly up to this point we have not had really an adversary relationship. We have attempted to enter into a kind of working partnership to get this problem resolved but, because of the adversary nature of this matter today and the issue as presented by the Protestant, I am constrained to say that we have enjoyed excellent cooperation and have cooperated with [73] the local and federal and State agencies. Frankly, I suspect that the Department of Interior would like us to wait the problem to death and not come to the table and sit down and talk. They are not concerned with any finding we might get, they just want to let it go and try to draw it out until the public is aroused and starts some crusade to save the pupfish.

Now, if I sound incensed about this it is because of the lack of the government, the Interior Department, from coming to the table to talk about the problem. Frankly, it serves the government ill, it seems to me, to wait and wait and finally when we have to take

some action, not just for the development of new land but in a substantial measure these applications are applications for at least the initial approval of permits for operating wells upon which the ranch relies to irrigate land presently under irrigation, and I think this was because of an engineering problem which arose because of the mistake made by another engineer, not Mr. Engstrom, which had been engaged by Spring Meadows to administer the filing of the applications. The applications that were filed on these wells were on the wrong locations and the wells were dug in a different location than that applied for and now the Applicant has put crops on the land and these new applications are merely to correct a mistake of an engineer and we have the testimony of an engineer today, here, because these wells [74] have to be approved and have not been and they are wells upon which we presently rely in a substantial measure to irrigate the land presently under cultivation.

So here, we have come a rather long way. The evidence is clear of the economic contribution that Spring Meadows has made to the State and it is not trying to disregard those fish, indeed, it has gone out of the way and spent its own money, paid engineers and all of these pump people, lawyers, to try and sit down and try to work out some kind of a situation to convert the water management program to work with the Desert Research Institute and U.S.G.S., in devising something to solve the problem and we have yet to get the Interior Department to sit down at a table with us and talk about what is going to be necessary for the ultimate solution to this problem and convert to a surface water management system, by Spring Meadows, which will govern and provide for irrigation methods of storing surface water and using supplemental wells which are not going to endanger the fish habitat. But they have not done that, they come in and here and object to our applications. We cannot wait, we have got to have the applications reviewed. The Engineer knows that there is a time limit on the applications and the ranch cannot live without water and the government is not in a position to assert, and apparently does not resist the request but asserts that the withdrawal exceeds the perennial recharge, but they [75] have no basis for that statement, and in that case, I suggest that we are not interfering with the government's water rights because the government's witness himself stated that the lowering of the water level at any point of diversion is not unreasonable.



Now, that was his precise statement and that is the statutory requirement with respect to the appropriation of water from an underground well.

Now, if the Engineer please, I am going to ask that the applications be granted, not in spite of a study, really, but one, because we need to have them granted and hopefully in granting these applications it will give the Interior Department a motivation to move and to sit down with us and discuss the problems, and that way will realize that they cannot just sit by until it goes away or Spring Meadows picks up the full bill for it.

I ask that the applications be granted.

MR. AHO: May I reply briefly?

MR. WESTERGARD: Yes.

MR. AHO: He questions my statement that Devil's Hole was added to the Death Valley Monument in

1952, primarily to protect the pupfish. To counter that allegation I would like to offer a copy of President Harry S. Truman's Proclamation No. 2961 establishing Devil's Hole as a part of the Death Valley Monument and the State Engineer can draw his own [76] conclusions as to whether or not the preservation of pupfish was the concern in the establishment of Devil's Hole.

Secondly, Mr. Wilson made quite a strong allusion to the position of the Department of Interior coming in here at this late date and saying give us another year or two before you take any action. In other words, we have been dragging our feet, give us another two years to drag our feet. All we are saying is that insufficient information is available and I think that that is the decision for the State Engineer to make as to whether his office, at the present time, has sufficient information. If he does feel it does not have, then I think it would be viable for all parties concerned to wait until the studies that I have mentioned have been completed and analyzed. It is true, perhaps, that there has been some foot dragging, is another problem back in Washington, but I think a strongly aroused public opinion to save the pupfish has started and I think that the State Engineers have been under these pressures from that source as well as the Department of Interior. I am quite sure that an aroused public opinion now will force Washington officially to move on the problem and I think I can assure Mr. Wilson that there will be no foot dragging on the problem.

I believe that if the State Engineer feels that a period of waiting be granted, I recommend that he strongly advise the Department of Interior in Washington that he is [77] only going to wait until such-and-



such a day to get that information; otherwise, he will take what action he feels the case merits.

I will rest.

MR. WILSON: Let me reply to that statement. One, the remarks regarding the decision being delayed until a January 1, 1972, deadline for study for a position to try to be formulated by the Interior Department. They can certainly recognize a notification back there on the Potomac, but I would caution you, Mr. Westergard, not to draw the inference from the comments here today that the success or the continuation of that study is going to depend upon the postponement of these applications, or it is going to be frustrated if these applications are going to be granted, that is not the case. That is not the case at all, this study is going ahead whether the applications are granted or not and the study was proposed and was not joined in by us, frankly, with the object of frustrating the applications themselves.

This is something that is needed for the entire area, not just Ash Meadows sub-Basin, but the Amargosa basin as well. This study will go forward whether or not the applications are granted; so let's not make the mistake of thinking that if these applications are granted the studies are moot, they are not. I challenge the government, frankly, well—strike that. [78]

I think that the indications are that the use of water is within the annual yield.

This includes the present pumping by the Applicant of the subject wells. That included in the present use of the water, I submit, is within the annual yield or the perennial recharge. Clearly, we are not lowering the water table by the mining of water. If that is the fact,

it is clear that we need that water and will be severely prejudiced without it, and I will submit it.

MR. AHO: Do you stipulate to the admission of Harry S. Truman's Proclamation or can the Engineer take judicial notice?

MR. WILSON: Yes, and I will like to also submit to the Engineer the interim report, Inland Basin Project, Amargosa Project, Nevada-California, of the United States Department of Interior, Bureau of Reclamation, and ask that it be recognized as a part of this record.

MR. AHO: All right.

MR. WESTERGARD: I don't think it is necessary to accept the Inland Basin report, we will take notice of it; however, a copy of the Proclamation will be admitted as Exhibit No. 1 for the Protestant.

We will be in recess for 10 minutes.

(Recess at 12:00 noon.)

(At 12:10 o'clock p.m., the hearing was called to order.) [79]

MR. WESTERGARD: We will be back in session.

At the recess the matter stood submitted, this was my understanding. Now, if there is anything else to be presented that you want a ruling on as far as further procedure, I would be glad to establish it in the record. If not, I intend to proceed.

MR. AHO: In view of the fact of the Endangered Species Act, I would like to call Dale Lockhart, Nevada Fish and Game Commission, a regional assistant for the fisheries, an official of the Fish and Game Commission, with reference to the protection of the pupfish.



MR. WILSON: I don't think there is any question about the statute regarding the endangered species, that is not at issue before the State Engineer. This is not a proper hearing for that. That would probably be the only statement that Mr. Lockhart could offer and I will accept that.

MR. WESTERGARD: The material that has been submitted by the State Endangered Species Committee has already been made a matter of record, it is available, and I personally reviewed it, as has my staff and we are well aware of it.

MR. AHO: You do not wish to hear from a representative of the State Fish & Game Commission?

MR. WESTERGARD: Well, I didn't think—I believe that the statutes have established a procedure for a hearing and to present it in this hearing would be objectionable. This has [80] been the subject of a couple of symposiums of which we are well aware. I know of no precedents in the matter and with that I will deny the request to re-open the hearing at this time and proceed.

I think that the record should reflect a brief history that has not been mentioned in the testimony and that is going to the point of an order that was issued by myself as State Engineer on May 5, 1970. It was issued to the Spring Meadows, Incorporated, and as I say it is a matter of our records but it is an essential portion of this order. I think it should be read into the record and it is as follows:

> "You are hereby notified and ordered to cease and thereafter desist from illegally diverting water pending full compliance with the provisions of the Nevada Water Law."

That is a direct quotation from the order.

Subsequent to this time an action was filed by Spring Meadows and a stay order was issued by the District Judge having jurisdiction, eventually causing a stay against any further action on our part to preclude the pumpage from those wells. The point in giving this history is that the issue now, I think, is—well, let me put it this way, I think that a determination is mandatory, not only in view of this previous action but in view of the fact that I think that the people involved on both sides are entitled, in fact, to a [81] decision soon. You know when that decision has to be and for that reason I am going to overrule the request of the government through Mr. Aho for an extension of time in making a determination on this matter. In this vein I do feel that through the information we have available in our records and through the expert testimony that was given here today and through the arguments, very frankly, there is no question in my mind what decision has to be made, and that again is my determination. And the reason for my determination is that further postponement of action is not in order.

There has been only brief reference, I believe it was by Mr. Wilson, he referred to an assertion of a federal water right. There is no record of a water right on Devil's Hole. I mention that because this is one of the criteria that the State Engineer must consider in making a decision, the possible effect on existing water rights. There are no water rights on Devil's Hole, so we will not pursue that any further. The statute, as has been pointed out several times this morning, provides that any appropriator must expect a reasonable lowering of the water table and I think the testimony, the expert



testimony was to the fact that there have not been an unreasonable lowering of the water table. Evidence to the contrary has not been submitted by the government, so the first criteria, then, effect on existing water rights, it is my ruling that the evidence before us in the case that [82] additional pumping under the proposed applications would not adversely affect existing water rights.

Another criteria in water law is that there must be an intent to place the water to a beneficial use and I think that the development that exists out there and the explanation of what was proposed for the future unquestionably indicates that there is an intent on behalf of the Applicant to place the water to beneficial use.

Another question on which there was considerable testimony was that of water availability. That is a primary criteria that must be considered. It is our finding that there is, in fact, water available for appropriation under these applications.

The final criteria that must be considered, then, is the effect or consideration of the public interest by prolonging a decision in this matter, or by, in fact, denying the proposed applications, which would essentially place a moratorium on the development of a large segment of Nye County. I don't think that the radius or extent of the area that might be considered necessary to preclude further development was even defined or no attempt was even made to define it, but I think, unquestionably, a postponement or denial would, in fact, be a moratorium not only on the people involved here but on numerous third parties who may in fact have some intent of development somewhere within the Ash [83] Meadows area. I think that

a moratorium in a large segment of the State, or a segment of the State is certainly not in the public interest. I think that the State and the individuals involved are entitled to their day to present whatever they wish to present to enable them to proceed with any development that they are seeking.

There was considerable testimony on the economic and financial impact of the Spring Meadows development. I think that in an area the size of Nye County, it certainly must be recognized that the revenue to the County and the State from that development again is in the public interest.

Considering these criteria and unfortunately or fortunately, I think, there have been pressures, but pressures do not give me the prerogative of waiving the basic considerations set forth by the Nevada Water Law and it is, therefore, my ruling that the protest to the applications that are the subject of this hearing are overruled and the applications will be issued subject to existing rights, upon payment of statutory permit fees.

I don't feel that I have the prerogative to make recommendations nor do I have the prerogative to include it as a part of this decision, that further detailed studies should be conducted, but I think the proposals that have been advanced by both parties are certainly something that should be pursued. But, although I won't put it in the form of a [84] recommendation, I will certainly concur that anything that can be developed to insure the best possible management of the water resources should be accomplished to the fullest extent possible within the confines of the Nevada Water Law.



Now, if there are to be appeals to this decision filed, the statute requires that they be within 30 days of the rendition of the order and that will be 30 days from today's date.

MR. AHO: While we are still on the record, I notice you made no reference to the Endangered Species Act. Was any consideration given to that by the State Engineer?

MR. WESTERGARD: Yes, I considered that, yes, I did. And I don't interpret the Endangered Species Act to require the maintenance of any given levels under any given situation and I think that that is the only way it could be applied here, if it were in fact applicable. [85]

* * *

State of Nevada, County of Clark—ss.

I. J. V. BROWER, Court Reporter, hereby certify that I took down in shorthand all of the proceedings had in this matter and that thereafter said notes were transcribed into typewriting at and under my direction and supervision and that the foregoing transcript constitutes a full, true and accurate record of the proceedings had.

/s/ J. V. Brower
J. V. BROWER, Court Reporter. [86]

## 14. Defendant's 1972 Exhibit B, Symposium on Rare and Endangered Fishes of the Death Valley System.

The Rare and Endangered Fishes of the Death Valley System—A Summary of the Proceedings of a Symposium Relating to Their Protection and Preservation

By
Edwin P. Pister
California Department of Fish and Game
Symposium Coordinator

Held at National Park Service Headquarters
Furnace Creek, California
November 18 and 19, 1969
Submitted for publication on
February 18, 1970

*Preface*

Shortly after the conclusion of the Death Valley Symposium, the Los Angeles office of the California Department of Fish and Game issued the following release to all news media in Southern California. This suffices admirably as an abstract of what occurred there.

December 1, 1969
For Immediate Release

WAY SOUGHT TO SAVE
RARE DESERT FISHES

While a thousand persons attended the Governor's Conference on California's Changing Environment, held recently in Los Angeles, an alarmed team of eminent life scientists was in the field, 300 miles away, mounting an attack on an acute and sig-



nificantly related problem in environmental survival.

Forty-five of the nation's leading ecologists, zoologists, biologists, resources managers and public land and water administrators made up the task force, using Death Valley National Monument headquarters as their command post.

Working two days and nights in session and in the field, they formed battle lines to save from extinction some of the nation's rarest and most endangered life forms—the ancient but little-known desert fishes of the Death Valley drainage system.

At least one of the fish species has somehow developed the ability to survive and reproduce in water up to 100 degrees in temperature, six times as saline as sea water, and with very little oxygen content.

The scientists believe that within the unique fishes, now threatened with extinction by man, may lie a biological key to man's adaptation and survival in his own changing environment.

Involved are six species of the colorful desert pupfish, hardly more than an inch long when full grown, and the unheralded Mojave chub—all of which evolved following the Pleistocene ice age and are the last of their species on earth.

When their prehistoric lakes dried up, the fishes adapted and survive in small, isolated, warm-water springs that still flow in North America's most extreme desert environment. The total of some of the separate species is confined to one or two bathtub-size pools.

Now, well drilling and the pumping of springs and the underground for new and planned agricultural developments within the Death Valley drainage system are on the brink of wiping out the fishes. At least two species have already been lost.

Coordinated by California's Department of Fish and Game, the desert conference drew an impressive array of talent and knowledge.

Included were scientists and specialists from National Park Service headquarters in Washington, D. C., U.S. Fish and Wildlife Service and Bureau of Land Management regional headquarters in Portland, Ore., Scripps Institute at La Jolla, the State universities and colleges of Michigan, California, Nevada and Arizona, the California and Nevada Departments of Fish and Game, regional officials of concerned Federal agencies, and informed conservationists from the private sector.

Their first accomplishment was the cataloging of the location, size, limnology, ownership and development status of every known water in which the endangered fishes are still living. Included are waters in Death Valley, Owens Valley and the Mojave Basin in California, and the Amargosa Valley in California and Nevada.

Priority listings of the most endangered species and waters followed, and from those listings a plan of action was worked out. Included are administrative action to hopefully save the rare fishes in their remaining, original habitat, and the transplanting of some of the fishes into suitable, alternate waters for temporary sanctuary.

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My first thought in reporting on the symposium was to list in detail the points made by the various panel participants. However, I felt that to do this would result in a rather cumbersome volume which might well tend to defeat the basic purpose of our meeting: the formulation and initiation of an action plan designed to preserve the various species and their habitats. Consequently, I have decided instead to summarize briefly each panel discussion and list in some detail the action plan and the arrangements necessary to bring it to a successful conclusion.

It is a natural tendency, when considering the problems of environmental protection and preservation in the face of almost unbelievable social and technocratic problems, to become unnecessarily pessimistic in discussing a means of overcoming them. If those of us who are concerned with these problems take this attitude, not only the Death Valley fishes, but mankind itself, face extinction.

Rather, I prefer to take the attitude that, if man really wants to overcome these problems and is willing to sacrifice accordingly to do so, nearly anything is possible. In effect, if we are able to muster the necessary finances and technology to place an astronaut on the moon, we most certainly can devise a means of preserving in acceptable condition not only pupfish habitat but the remainder of the earth's environment as well. It is within this philosophy that the symposium was initially conceived at a meeting in Death Valley during April, 1969. It is with this same philosophy that we must approach our current problems of environmental protection if we are to be successful in solving them. In the long run, things like preserving pupfish are far more

important than running a successful space program. For if we fail in the former, our spaceships may well, at *some* future date, find themselves with nothing to return to.

*Summary*

Following an introduction and welcome by Superintendent Robert Murphy of Death Valley National Monument, the various agenda items were discussed, as summarized below. A list of those in attendance is appended.

Tuesday, November 18.

8:00 a.m. Current status of the various species, with a priority listing of those most endangered.

Chairman: Dr. Robert R. Miller, University of Michigan

Panel Members: Dr. James Deacon, University of Nevada, Las Vegas

Dr. David Greenfield, Calif. State College, Fullerton

Dr. Carl L. Hubbs, Scripps Institution of Oceanography

Discussion:

Prior to 1900, the native fish fauna of the Death Valley System had not been significantly altered by man. Since that time, conditions have changed drastically in locations throughout the area. Instrumental here were the introduction of mosquitofish (*Gambusia affinis*), water expert from the lower Owens Valley by the City of Los Angeles, the introduction of largemouth black bass (*Micropterus salmoides*) and brown trout (*Salmo trutta*) into various portions of the drainage and, most recently, the development of large-scale agricultural operations in portions of Nye County, Nevada.



Of the various factors listed, the latter ranks with the introduction of *Gambusia* as the most detrimental and, if carried to an extreme, could very likely lower the water table of the Ash Meadows area to a point where all remaining habitat will be eliminated.

The first step toward habitat protection in this area was the establishment in 1952 of Devil's Hole as part of Death Valley National Monument. Interestingly, this was done ostensibly because of the unique travertine limestone formations, but not to preserve *Cyprinodon diabolis,* the unique fish inhabitant.

Following the symposium, Bob Miller summarized the current status of the Death Valley System fishes in a report to the National Park Service as follows:

Survival of Fish Populations

The fishes inhabiting the Death Valley System—which includes the drainage basins of Owens River, Mohave River, Amargosa River, and Pahrump Valley, in California and Nevada—comprise 11 species in 3 families: the minnows (1 dace and 2 chubs), suckers (1 species), and killifishes (5 pupfishes, genus *Cyprinodon,* 2 killifishes, genus *Empetrichthys*). As of the date of the symposium one full species, the Ash Meadows killifish (*Empetrichthys merriami*) and one subspecies, the Shoshone pupfish (*Cyprinodon nevadensis shoshone*), are extinct; the status of the Tecopa pupfish (*Cyprinodon nevadensis calidae*) is uncertain, but it too may be gone. Man is directly or indirectly responsible for the loss of these fishes.

Other populations of *Cyprinodon nevadensis* are badly depleted and some are seriously endan-

gered. The Pahrump Valley killifish (*Empetrichthys latos*) is in critical condition—an entire genus threatened with extinction. Even the Devil's Hole pupfish (*Cyprinodon diabolis*), protected within a detached part of Death Valley National Monument, is endangered by the proposed sinking and pumping of a well within feet of the monument boundary. (A 1963 U.S. Geological Survey report indicates that the aquifer feeding Devil's Hole, the sole abode of this unique species, could be seriously altered within one year after pumping commences.)

Below Tecopa, and especially in Death Valley proper, the native fish populations appear to be in good condition as of this writing. Proposed development of the Amargosa River (see end of report) however, could change this, thereby threatening ecosystems in Death Valley National Monument.

### Priority Listing of Endangered Species

In order to propose an action program designed to preserve and maintain endangered fishes and their aquatic ecosystems, it is necessary to identify the threatened forms and to arrange them by priority. This listing follows:

1. Pahrump killifish, *Empetrichythys latos*. Originally there were 2 living species in this genus but now only 1 survives. It is therefore the most critically threatened fish in the Death Valley System since the survival of an entire genus is in jeopardy. The only population, reduced to a handful of individuals, is barely existing at Manse Ranch, Pahrump Valley, Nevada.



2. Devil's Hole pupfish, *Cyprinodon diabolis*. This species is endangered because of its very restricted habitat—scarcely as large as a backyard swimming pool—and low population (about 200 to 700 individuals, annual fluctuation). It is now further threatened by well pumping (the device already installed but not functional as of Nov. 18, 1969) at the very edge of the boundary of Death Valley National Monument.
3. Owens pupfish, *Cyprinodon radiosus*. This species, now restricted to Fish Slough, Owens Valley, California, was nearly lost last summer when much of its known remaining habitat dried; alert action by Bob Brown of UCLA, aided by Phil Pister, probably saved the fish. The Owens Valley Native Fish Sanctuary in Fish Slough was completed shortly before the Death Valley Symposium and will be ready for occupancy after the exotic species have been eliminated. Post-conference investigation of BLM spring, also in Fish Slough, proposed as a supplemental refuge, revealed that the Owens pupfish survives there as it probably does also in several other places in the Fish Slough region. Hopefully, by 1971, this fish may be removed from the world list of endangered freshwater fishes (Miller, 1969).
4. Nevada pupfish, *Cyprinodon nevadensis mionectes*. Many populations of this fish, which is confined to Ash Meadows, Nevada, have already been lost and others are threatened by agricultural development, especially by excessive (and presumably illegal) pumping and also by physical destruction (by mechanized technocracy) of natural habitats. Springs so destroyed

may be lost forever. In view of the post-conference information on the Owens pupfish, the Nevada pupfish probably deserves a higher priority listing.

5. Mohave chub, *Gila* (*Siphateles*) *mohavensis*. Unquestioned pure populations of this species now appear to be restricted to Lake Tuendae, the spring-fed pond at Zzyzx Resort on the west side of Soda (Dry) Lake about 9 miles south of Baker, San Bernardino County, California.
6. Tecopa pupfish, *Cyprinodon nevadensis calidae*. The current status of this subspecies is uncertain, and additional field work and further taxonomic analyses of new material are needed to clarify its status. Originally it was known only from the outlets of Tecopa Hot Springs, Inyo County, California, where it now appears to be extinct.
7. Warm spring pupfish, *Cyprinodon nevadensis pectoralis*. The type locality of this fish in Ash Meadows, Nevada, has been set aside by BLM as a refuge, with an artificial pond outside of the fenced habitat for public viewing of the subspecies. Its very restricted range places this fish in the endangered category.

Undetermined Status of Endangered Species

It was thought advisable not to give priority rating to several species of Owens Valley fishes whose current population sizes are unknown, but which have decreased markedly in abundance in past decades. These are:

1. Owens chub, *Gila* (*Siphateles*) sp. D. W. Greenfield reported that he has been unable to find



this fish in Owens Valley proper (where it was formerly common), but he did locate a population in the Lake Crowley (Long Valley) part of Owens River; a chub has also been taken by UCLA workers and the California Department of Fish and Game in the gorge of Owens River below Lake Crowley as well as in the reservoir itself. The identity of these chubs has not been determined but will be soon. This species and the two that follow are to be reintroduced in 1970 into the Owens Valley Native Fish Sanctuary in Fish Slough north of Bishop.

2. Speckled dace, *Rhinichthys osculus*. The status of the Owens River populations is unknown.
3. Owens sucker, *Catostomus* sp. This fish still survives throughout much of Owens River.

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9:45 a.m. Progress report on existing and planned sanctuaries.

Chairman: Dr. James Deacon, University of Nevada, Las Vegas.

Panel Members: Dr. Wendell Minckley, Arizona State University, Tempe.

Mr. James St. Amant, California Department of Fish and Game, Los Angeles.

Mr. Philip Pister, California Department of Fish and Game, Bishop.

Mr. Robert Borovicka, Bureau of Land Management, Portland, Oregon.

Mr. James Yoakum, Bureau of Land Management, Reno, Nevada.

Mr. Lewis Myers, Bureau of Land Management, Las Vegas, Nevada.

Discussion:

Wendell Minckley has been successful in maintaining populations of several species (not *C. Diabolis*) in concrete ponds at Arizona State University. These populations have existed without either significant care or feeding in temperatures that drop to as low as 34-35°F. This lends cause for optimism concerning the creation of artificial refugia. Nevertheless, it was the consensus of the group that every effort should be made to maintain these fishes in their native environments and to resort to artificial refugia only if absolutely necessary to maintain the species.

The Bureau of Land Management reported that all federal conservation agencies were directed by Congress (under the rare and endangered species act) in 1966, to concern themselves with the preservation of rare and endangered species. Following this, the Nevada Fish and Game Commission and University of Nevada at Las Vegas requested BLM to initiate a cooperative land management and conservation program. Under this program, the Fish and Game Commission and University determine which species need attention, then habitat management plans are developed by BLM. Under the law, BLM manages the habitat but not the fish and wildlife species existing therein. As part of their general investigations under this cooperative arrangement, BLM has located 15-20 warm springs in other areas of Nevada as possibilities for transplant sites. School and Jackrabbit Springs have already been set aside as sanctuary sites.

Discussion was again held emphasizing the need for preserving the original habitat. The disadvantages of enlarging existing habitats were enumerated. In this



connection, when School Spring was recently set aside as a sanctuary, it was enlarged to duplicate what originally existed there.

The evolution of the Owens Valley Native Fish Sanctuary north of Bishop was described. Completed in October, 1969, this five-acre pond will provide refuge not only for *Cyprinodon radiosus,* but for the other three native Owens Valley species (*Rhinichthys osculus, Catostomus* sp., and *Gila* sp.) as well. An additional refugium, planned at BLM Spring on the east side of Fish Slough, was also described. The plight of *Cyprinodon radiosus* during the summer of 1969 was described in detail.

Because of ever-increasing interest by the academic community in the ecology of the Owens Valley, the idea of requesting Ecological Reserve status for the entire Fish Slough area is worthy of further consideration. The Fish Slough drainage is the only portion of the Owens Valley which remains essentially unaffected by man's activities.

Lew Myers, BLM District Wildlife Specialist from Las Vegas, reviewed inventory work done on rare and endangered species habitats by BLM in 1967 which resulted in a "first priority" classification for the native fishes in Ash Meadows. Habitat management plans were completed in 1968 for Jackrabbit and School springs. At that time Jackrabbit Spring was in good condition but contained exotic species. School Spring was in poor condition, with most of the habitat destroyed through overuse by livestock, waste of water in non-habitat areas, and an excess of aquatic plants.

The habitat management plan for Jackrabbit Spring recommended barriers to exclude exotic species, fences to

exclude livestock, and additional ponds to allow viewing by the public.

The habitat management plan for School Spring called for protection and complete fencing of spring areas and the construction of another pond to utilize wasted water. This pond provides additional habitat and facilities viewing by the public. A barrier was installed in the pond water supply pipe to prevent fish from moving between the first and second ponds.

In the case of both springs, BLM owns the land but private interests own the water rights. BLM has an agreement for the use of School Spring water for a sanctuary, but no agreement exists for Jackrabbit Spring.

It was further pointed out that about 7 wells have been drilled within 3½ miles of Devil's Hole, and reports indicate that the water level in this area will soon be affected. One well has been drilled within a few hundred yards of Devil's Hole at the edge of the National Monument boundary.

Lew Myers also reported that Ely District of BLM has developed large warmwater pool areas for use as refugia.

Lew's report provided good background information for the afternoon's field trip to Ash Meadows, which he led with the assistance of Dale Lockard of Nevada Fish and Game and Jim Deacon of the University of Nevada at Las Vegas.

1:30 p.m. Field trip to Ash Meadows

Leaders: Mr. Lew Myers, BLM, Las Vegas.
Dr. James Deacon, University of Nevada, Las Vegas.
Mr. Dale Lockard, Nevada Fish and Game Commission, Las Vegas.



The few hours spent on the Ash Meadows tour were more than adequate to point out the immense destruction and alteration of the terrestrial and aquatic habitats resulting from the activities of Spring Meadows, Inc. Several springs have been severely changed and their fish populations either eliminated or placed in extreme jeopardy. Pumping was being carried on directly from Jackrabbit Spring, and all fish life had been destroyed.

Longstreet Spring has been bulldozed and dirt piled up on the banks; and Point of Rocks Spring has a pump located immediately adjacent to it. The pump next to Devil's Hole has already been described.

On the brighter side, Big Spring is largely untouched, and a good possibility exists that it might be purchased by the Nature Conservancy.

Underlying the entire problem, however, is the somber fact that, almost unquestionably, sustained pumping in the Ash Meadows area will ultimately destroy all remaining habitat if continued indefinitely. The only real uncertainty is just when this will occur. Perhaps this item should henceforth receive the majority of our attention.

8:30 p.m. Discussion of current research on Death Valley system endangered species, and additional research desirable for species preservation.

Chairman: Dr. Vladimir Walters, U.C.L.A.

Panel Members: Dr. Robert R. Miller, University of Michigan
Dr. James Deacon, University of Nevada, Las Vegas

Dr. Wendell Minckley, Arizona State University, Tempe

Dr. David Greenfield, Calif. State College, Fullerton

Dr. Robert K. Liu, U.C.L.A.

Dr. James Brown, U.C.L.A.

Mr. James Labounty, U.S. Bureau of Reclamation, Las Vegas

Mr. Robert E. Brown, U.C.L.A.

Discussion:

It was very evident from the discussion that our knowledge of the taxonomy of the Death Valley system fishes greatly exceeds our knowledge of their biology. A minor point of disagreement was resolved concerning the responsibilities of the agencies as opposed to the universities relative to habitat development, research, etc. It was generally agreed, and seems rather obvious, that problems of land use, sanctuary development and similar items should be handled by the public agencies, whereas most research work should be carried on by the academic community. However, close communication and cooperative effort between the two groups is both desirable and necessary if we are to accomplish our goal of species preservation, inasmuch as the power development of habitat and sanctuary areas is completely dependent upon the extent of our knowledge of the species involved.

The following areas of research were discussed and outlined as desirable for species preservation, although the potential for research on *Cyprinodon* is nearly infinite.

1. Interrelationships of the different species of *Cyprinodon*.



2. Cytomorphology (should be included in taxonomic work).
3. Behavioral reactions and interactions of *Cyprinodon* and mollies as related to courtship and feeding.
4. How have these fishes endured for so long in such a restricted habitat? Why and how are they so plastic?
5. Osmoregulation and demographic parameter studies on types of artificially created habitat.

Jim Deacon reported that his current research on the Death Valley fishes is primarily ecological and in the field. Work is being conducted on Salt Creek, Pupfish Marsh, Zzyzx and Saratoga Springs. Taxonomic and feeding habit studies are in progress, and it is likely that a new species will be described from Pupfish Marsh. At Saratoga Springs, population size and structure is being studied in relation to reproductive influences. It has been found that starvation is an important factor in summer months when both populations and degree of activity are at a maximum.

The range of temperature tolerance for populations at Saratoga Springs is from 33-34°F. to 110°F. However, the temperature there does not exceed 95°F. for any significant length of time. Fish are not found active in the marsh at temperatures below 40°F. Below this temperature they burrow in the mud and exist under nearly anaerobic conditions.

*Cyprinodon diabolis* populations in Devil's Hole fluctuate from about 200 to 700, reaching a maximum near the end of summer. Starvation during periods of maximum population is probably their limiting factor. Their temperature tolerance drops to 8-9°C. (46-48°F.), but they are immobilized at 14°C. (57°F.)

Bob Miller has found a significant difference in the Shoshone Springs populations when comparing fish collected in 1947 and 1969. This was primarily noted in increased pelvic ray counts and rounded body characteristic in collections made in 1969. Collections made in 1947 showed greatly reduced pelvic ray counts and a slab-sided appearance. He concluded that the population presently inhabiting Shoshone Springs is derived from the Amargosa River populations and that *C. n. shoshone* is extinct.

Work has been conducted recently by Dave Greenfield in comparing various species of *Gila: mohavensis, orcutti,* and *snyderi* from Owens Valley. Chromosome numbers were determined as 54 in *snyderi,* 52 in *mohavensis,* and 50 in *orcutti.* These differences have been confirmed by electrophoretic studies of eye lens tissue. Jim LaBounty reported that Cottonball (Pupfish) Marsh *Cyprinodon* are meristically different from *C. salinus* and that they can exist in water ranging from distilled to 6 times sea water. *C. salinus* exhibits a tolerance range of about half this magnitude.

In this connection, Bob Brown's proposal to study the osmoregulatory processes of the genus takes an even greater interest and significance. Part of this study will involve the effect of monovalent and divalent ions on mucus production.

The interest and activity of the various colleges and universities in conducting research on *Cyprinodon* and related species is most heartening. Ultimately, our ability to preserve these fishes may well depend upon the extent of our knowledge concerning them. Hence the desirability of learning as much as possible as quickly as possible.

Adjournment for November 18 at 11:00 p.m.



Wednesday, November 19.

8:00 a.m. Land acquisition costs and funding—the role of non-governmental groups.

Chairman: Mr. Clinton Lostetter, Rare and Endangered Species Coordinator, Bureau of Sport Fisheries and Wildlife, Portland, Oregon.

Panel Members: Mr. Martin Litton, Free-lance writer and Sierra Club Director

Mr. Keith Artz, The Nature Conservancy

Dr. Sterling Bunnell, The Nature Conservancy

Discussion:

Senate bill 11363, which was enacted on November 10, 1969, provides financing for rare and endangered species preservation and prohibits importation and interstate shipments of endangered species. This bill provides a firm basis for rare and endangered species work by the federal government. However, the assistance of other public agencies and private individuals is necessary to get the job done effectively.

Keith Artz and Sterling Bunnell outlined the role of the Nature Conservancy and clarified the mechanics of its operation. Inasmuch as the purchase of the land provides the most certain way to insure habitat preservation, the Nature Conservancy prefers to purchase a given area and then transfer it to a management agency with a revertible clause in the deed. For this purpose, the Nature Conservancy can borrow money (at prime interest plus one percent) with Ford Foundation backing. Where possible, this is done with the intent of ultimately having the land purchased by the governmental

agency involved. This allows the "holding" of desirable lands until the necessary funds can be budgeted through regular channels. The Nature Conservancy recently purchased Furnace Creek Ranch in this manner, and is now awaiting reimbursement from the National Park Service.

Martin Litton pointed out the need for immediate publicity and legal advice to preserve the various Ash Meadows habitats. In this connection, the effect of groundwater exploration in Ash Meadows on the various features of Death Valley (Furnace Creek, Amargosa River, Devil's Gold Course, Badwater, etc.) should be quickly and competently ascertained. Martin has some excellent connections with the news media and will work with them in publicizing the problem.

11:00 a.m. Status report on existing and potential habitats and water sources.

Chairman: Mr. Robert Borovicka, Bureau of Land Management, Portland, Oregon.

Panel Members: Mr. Ed. Smith, BLM, Sacramento
Mr. Bob Jennings, BLM, Bakersfield
Mr. Bill Templeton, BLM, Riverside
Mr. Don Cain, BLM, Ely, Nevada
Mr. Jim LaBounty, Bureau of Reclamation, Las Vegas
Mr. Pete Sanchez, National Park Service, Death Valley
Mr. Dale Lockard, Nevada Fish and Game, Las Vegas
Mr. Phil Pister, California Department of Fish and Game, Bishop



Discussion:

The Multiple Use Act of 1964 changed the basic orientation of BLM, and the California Desert Study has been the first major step by BLM geared toward inventorying and planning for the use of desert lands. This, of course, is basic to acquiring funds for management projects. Initial phases of the study have involved the cooperation of a Park Service team. Of approximately 15 million acres of desert lying within California, over 11 million are administered by BLM. A district ranger concept is being considered, together with interpretive centers in several locations.

The second phase of the Desert Study is currently under consideration in Washington and, if approved, will lead to the third phase which will involve the implementation of planning drafted in the first two phases.

Possible habitat areas at Saline Valley, China Lake Naval Weapons Center, Fish Slough, River Springs, Zzyzx, Piute Springs, Two-Hole Springs, Baker Lake Charcoal Pit, Benton, Keogh's, and Owens Lake (all in California); and Mt. Wheeler and Big Spring (both in Nevada) were discussed in varying degrees of detail.

Many of them present excellent possibilities and will be included for further investigation prior to the next meeting of the group.

Zzyzx Spring is located on the invalid mining claim which will soon come up for review. Final eviction will not occur for some time at best. A management plan will be prepared if the current occupant is evicted.

The use of the Hot Springs on the western slope of Mt. Wheeler shows great promise for reestablishing three

species of rare fishes: The Moapa dace (*Moapa coriacea*), Pahranagat roundtail chub (*Gila robusta jordani*), and Pahrump killifish (*Empetrichthys latos*). A habitat management plan for this area is being given top priority, and refugia should be constructed in 1970 for two or three species.

Nevada Fish and Game is currently corresponding with the owner of Big Spring (Ash Meadows) in an attempt to negotiate a lease or purchase. The Nature Conservancy may also become involved in this venture. In addition, Nevada Fish and Game is inventorying and documenting all water sources containing populations of rare species. One of their problems (which is general) is the infestation of suitable sites with exotic species.

An intriguing idea interjected at this point was the possibility of interesting Howard Hughes in developing a desert museum for rare fishes in the Las Vegas area. Martin Litton will investigate this further.

A review by Jim LaBounty of a Bureau of Reclamation reconnaissance report recently released on the proposed Amargosa River project, reveals that the area currently contemplated covers from six miles north of Devil's Hole northward through Lathrop Wells. The water in this area is suitable for irrigation, as opposed to Ash Meadows water, which is reported to be unsuitable. In the area which Jim described are 92,000 acres of arable land with good underground water supplies. A favorable benefit-cost ratio of 3.6 to 1 has been calculated. A more detailed study has been authorized for the period 1971-74 at a cost of $750,000.

Actual work to date by California Fish and Game has been restricted to Fish Slough, with considerable reconnaissance being conducted in other areas. Ground reconnaissance has been supplemented by a set of aerial photographs of the entire Amargosa River and Death Valley drainage areas which have already been useful in locating additional refugia. Especially promising here is a location near Scotty's Castle which later ground reconnaissance indicated to be apparently suitable for the purpose at hand.



3:00 p.m. Legal bases for protecting existing water sources and habitat.

Chairman: Leonard Fisk, Calif. Dept. of Fish and Game, Sacramento

Panel Members: Mr. Dale Lockard, Nevada Fish and Game, Las Vegas

Mr. Robert Murphy, National Park Service, Death Valley

Mr. William Newman, Nevada Div. of Water Resources, Carson City, Nevada

Mr. Homer Leach, National Park Service, Death Valley

Mr. Orthello Wallis, National Park Service, Washington, D.C.

Mr. Robert Borovicka, BLM, Portland, Oregon

Discussion:

Perhaps one of the best signs of our immaturity as a society (as reflected in conservation legislation) is the problem we face in gaining recognition of fish and wildlife as beneficial uses in water rights matters.

Progress is being made in this direction, but very slowly. Dale Lockard reviewed the current situation in Nevada and was followed by Bill Newman, who gave a brief history of Nevada water law and stated the problems

encountered by a water administrator in the face of stock and agriculture oriented state government. At present, Nevada Fish and Game may protest a water application, but has very little legal basis for having the protest recognized in the courts.

Nevada initially adhered to a strict riparian doctrine which was repudiated in 1885 and changed to a system of prior appropriation. At present, application for water appropriation is made to the State Engineer. The notice of intent is then published followed by a 30-day period for filing protests. The State Engineer researches the application to determine if any prior rights have been infringed upon, and then renders his decision.

The establishment of Death Valley National Monument in 1933 was conditioned upon recognition of existing water rights. The rights of the Park Service and private in-holdings have been perfected. Currently, the Park Service files for water rights and then can issue a secondary water right to a permittee within the Monument. The Natural Landmarks Program was outlined, and its possible value in rare species preservation planning was discussed. This might have value at Manse Spring.

The point was made that land ownership does not necessarily include the water right and that the law of prior appropriation applies in most instances. The states control the water rights, and a determined effort should be made by all states to have fish and wildlife included as a beneficial use of water.

5:00 p.m. Summary and preparation of plan.

Chairman: Mr. Richardson, Calif. Dept. of Fish and Game, Los Angeles
Mr. Pister, Calif. Dept. of Fish and Game, Bishop



Participants: All remaining at session
(About 25 key persons were able to remain for this all-important discussion).

Discussion:

Sufficient data and discussion had now been presented to allow for the preparation of an action plan for species preservation. Although adhering firmly to the concept that every effort should be made to preserve and enhance all existing natural habitat, the group felt it would be wise to establish "money in the bank" refugia while awaiting the results of our current issue with technocracy. Priorities for preservation of the various species are summarized below:

1. *Empetrichthys latos*
2. *Cyprinodon diabolis*
3. *Cyprinodon radiosus*
4. *Cyprinodon nevadensis mionectes*
5. *Gila mohavensis*
6. *Cyprinodon nevadensis calidae*
7. *Cyrpinodon nevadensis pectorialis*

Several species of Owens Valley fishes were not given priorities but were listed for further study to ascertain their status: Owens chub, *Gila* (*Siphateles*) sp.; Owens sucker *Catostomus* sp.; and Specked dace, *Rhinichythys osculus.*

## PLAN

1. *Empetrichthys latos,* Pahrump killifish
   a. Jim Deacon will make application for natural landmark status at Manse Spring.
   b. Jim Deacon will coordinate a committee of Lew Myers, Dale Lockard, and himself to investigate spring areas in Nevada as additional refu-

gia for *E. latos*. This committee investigated the spring seepage east of the road from Manse Ranch and found it to be an artesian well located on private land.

c. Lew Myers will check the possibility of using pumped water or spring flow diverted to BLM lands for additional refugia.

d. Phil Pister will coordinate a committee of Ed Smith (or his representative from BLM), Tom Jenkins from the Sierra Nevada Aquatic Research Laboratory of the Bureau of Sport Fisheries and Wildlife, Bob Brown of U.C.L.A., and Vern Burandt of California Fish and Game to determine the feasibility of constructing a refuge at the cold spring at Lower Warm Spring on the east side of Saline Valley.

2. *Cyprinodon diabolis:* Devil's Hole pupfish

a. Phil Pister will coordinate a committee of Ed Smith (or his representative from BLM), Tom Jenkins, Bob Brown and Vern Burandt to construct a refuge at Upper Warm Spring on the east side of Saline Valley.

b. Dale Lockard will check a spring area about seven miles southwest of Denio, Humboldt County, Nevada to determine its suitability for development into a refuge.

c. Leonard Fisk will check with Millard Coots of California Fish and Game concerning warm spring areas about 10 miles east of Susanville, near Wendell.

d. Clint Lostetter and Dale Lockard will check a large pool area at a Nevada State Park near Garlock to determine its suitability for *Cyprinodon diabolis*.



Should the areas referred to prove suitable for the establishment of *C. diabolis*, the persons involved will make every possible effort to create refuges at the earliest possible date.

3. *Cyrprinodon radiosus*, Owens pupfish.

a. Phil Pister will work with Bob Miller and Bob Brown in re-establishing *C. radiosus* into the newly-created Fish Slough sanctuary, probably in June or July of 1970.

b. Phil Pister will work with Ed Smith of BLM to plan construction of another refuge on the east side of Fish Slough at BLM Spring.

c. Bob Miller will write a letter to the State Director of BLM urging construction of a sanctuary at BLM Spring at the earliest possible date.

4. *Cyprinodon nevadensis mionectis*, Ash Meadows pupfish.

a. Keith Artz of the Nature Conservancy is collecting photos and will start work on possibility of acquiring Big Spring through a publicity campaign for fund raising.

b. Dale Lockard and Jim Deacon will, depending upon results under "a" above, attempt to achieve Natural Landmark status for Big Spring.

c. Lew Myers will meet with Spring Meadows, Inc., on November 20 in an attempt to achieve rehabilitation of Jackrabbit Spring.

d. Jim Deacon will arrange for hydrologic survey of Big Spring by a Las Vegas consultant.

e. Vlad. Walters and Jim Brown, working with Jim Deacon and Dale Lockard, will make every effort to keep duplicate populations in

aquaria at U.C.L.A., although doing so successfully involves overcoming some very difficult technical problems.

f. A series of letters expressing general concern over the problem at Ash Meadows and expressing thanks for positive action to date will be sent to Nevada Fish and Game, Nevada State Office of BLM, Nevada Division of Water Resources, Senator Alan Bible, and other legislators. These letters will be drafted by Tina Nappe for Bob Miller's signature.

5. *Gila mohavensis,* Mohave chub.

a. The Mohave chub is now established at Paradise Spa near Las Vegas. Jim Deacon and Dale Lockard will watch over this introduction.

b. Leonard Fisk, Jim St. Amant, and Bill Richardson will investigate habitat and suitability at Lark Seep Lagoon (Naval Weapons Center), South Coast Botanic Garden near Marineland, 1-Hole and 2-Hole Springs, San Felipe Creek in Sentenac Canyon (San Diego County) and Piute Springs. Introductions will be made where feasible.

c. Dave Greenfield of Cal State Fullerton will work with Bill Templeton of BLM and Jim St. Amant and Leonard Fisk of Cal. Fish and Game in watching Zzyzx Spring and will formulate a plan if the current resident, Dr. Springer, is evicted.

6. *Cyprinodon nevadensis calidae,* Tecopa pupfish.

a. Phil Pister and Jim Deacon will check populations in the Tecopa area.



b. A series of specimens will be sent to Bob Miller at Ann Arbor for identification.

c. Further action will be dependent upon Bob Miller's determinations.

7. *Cyprinodon nevadensis pectoralis,* Warm Spring pupfish.

a. BLM has completed a fenced refugium at School Spring, Ash Meadows. Lew Myers, Jim Deacon, and Dale Lockard will investigate the possibility of broadening the School Spring refuge to include Mexican Spring and Scruggs Spring, both of which are on BLM land.

b. Lew Myers is preparing a habitat management plan for the entire Ash Meadows complex.

Summary of assignments:

1. *Empetrichthys latos*

a. Deacon

b. Deacon, Myers, Lockard

c. Myers

d. Pister, Smith, Jenkins, Brown, Burandt

2. *Cyprinodon diabolis*

a. Pister, Smith, Jenkins, Brown, Burandt

b. Lockard

c. Fisk, Coots

d. Lostetter, Lockard

3. *Cyprinodon radiosus*

a. Pister, Miller, Brown

b. Pister, Smith

c. Miller

4. *Cyprinodon nevadensis mionectes*
   a. Artz
   b. Lockard, Deacon
   c. Myers
   d. Deacon
   e. Walters, Brown, Deacon, Lockard
   f. Nappe, Miller
5. *Gila mohavensis*
   a. Deacon, Lockard
   b. Fisk, St. Amant, Richardson
   c. Greenfield, Templeton, St. Amant, Fisk
6. *Cyprinodon nevadensis calidae*
   a. Pister, Deacon
   b. Miller
   c. Miller
7. *Cyprinodon nevadensis pectoralis*
   a. Myers, Deacon, Lockard
   b. Myers

*Additional Assignments*

1. Martin Litton will serve as publicity coordinator, working with whatever media he feels can best handle the matter of creating a public awareness of the plight of the Death Valley fishes in general and the problems created by Spring Meadows, Inc., in particular. In this connection, any information and progress reports having publicity value should be sent to Martin for his use.
2. Pete Sanchez, Homer Leach, and Bob Murphy will contact USCS concerning the ground water level in Ash Meadows and the effect of pumping



both on the Ash Meadows springs and the water resources within Death Valley National Monument.

3. Dale Lockard will provide Martin Litton with Hughes contacts concerning the Desert Museum concept.
4. Pete Sanchez will contact the operators of Furnace Creek Ranch concerning the use of rotenone to remove *Gumbusia affinis* from the Furnace Creek system. Phil Pister will work with Pete Sanchez in this matter.
5. Bob Miller will prepare a check list of items to be considered in determining whether or not a certain spring area might be suitable for pupfish introduction. This will be of great value to agency field personnel who are unfamiliar with ecological requirements and will reduce the number of areas to be checked by eliminating those which are obviously unsuitable.
6. Phil Pister will continue to serve as coordinator for the interagency plan to preserve the Death Valley fishes. Bob Miller, Jim Deacon, and Bob Borovicka will assist. In this connection, the coordinating committee requests that close communication be continued between all in attendance at the symposium. We ask especially that reports be sent regularly to Phil Pister, Department of Fish and Game, 407 West Line Street, Bishop 93514, as your work on the action plan progresses.
7. Bob Borovicka raised the question of how many individuals of the various Death Valley fishes could safely be removed from their existing habitats, even for valid research purposes. Authority

to grant such requests rests with the fish and game departments of Nevada and California under the laws governing scientific collecting permits. In the case of a request to collect within Death Valley National Monument, an *additional* collector's permit must be obtained from the Park Service.

It was decided that requests to *any* agency to collect *any* of the Death Valley fishes should be forwarded to Phil Pister, who will send copies to Miller, Deacon, and Borovicka for their comments and recommendations. Approval must be unanimous, or the request will be returned to the agency involved with the recommendation that it be denied. However, inasmuch as final approval rests with the agency and not the coordinating committee a recommendation for approval or denial does not guarantee that the agency will act accordingly.

Much of this will seem to constitute unnecessary red-tape to those who wish to collect fish for individual research projects and who regard such collections from an understandably narrow viewpoint. However, recent publicity given to pupfish by the news media, plus increased research demands by the academic community, have resulted in an almost unbelievable number of requests to the three agencies involved. Hopefully, collectors will realize that their request may well be only one of many and, if carried to extremes, could result in the very thing we are trying to prevent: the extinction of certain groups of Death Valley fishes.

The coordinating committee wishes to thank all those who attended the symposium, and in particular those who participated in the panel discussions. We feel the meeting was very successful, in that a vast amount of



knowledge was presented, discussed, and worked into a sound plan for habitat protection and species preservation. However, although we now have a coordinated approach to the problem, we still have a long way to go before we win the battle. Our plan will be no more effective than the amount of time and industry we are willing to devote to it. We are further faced with an agricultural development plan for the Amargosa River basin which is considerably greater than that already in operation at Ash Meadows. We must therefore work hard and remain alert to any plans for additional habitat destruction within the Death Valley system. Of extreme importance will be our ability to communicate the overall problem to the public who, in the final analysis, will decide whether agriculture, pupfish, or a compromise of both will prevail within the Death Valley system.

We wish to extend special thanks to Superintendent Bob Murphy of Death Valley National Monument for making available the excellent meeting facilities at Park Service Headquarters. Much of the success of the meeting is directly attributable to the cooperation of Bob and his staff.

In order to keep our program alive, we have scheduled a similar symposium for November 17 and 18, 1970, at Furnace Creek. At this meeting we shall evaluate progress to date on the action plan, discuss new developments in our search for refuge sites, review the state of affairs at Ash Meadows, and generally reassess our position and the status quo. We are already looking forward to meeting with you again.

## APPENDIX

### Developments Since Symposium Ended on November 19

1. Lew Myers and Bob Borovicka met with Spring Meadows, Inc. on November 20. At this meeting it was agreed that the pump complex would be removed from Jackrabbit Spring and that they would use only a natural channel to the south of the spring to receive spring flow (the ditch to the west will be restored). Spring Meadows, Inc. will construct a water storage pit at least 300 feet from the spring to receive the full spring flow via the natural channel. This will be used as a pumping pit. The foregoing will allow the restoration of Jackrabbit Spring as pupfish habitat, and *C. n. mionectes* will be reintroduced. Spring Meadows, Inc. still wishes to pump from the well at the corner the Devil's Hole property line. However, BLM stood firm on their decision denying them a right of way for a ditch from the well. BLM further recommended that Spring Meadows, Inc. abandon the well and restore the site.

2. On November 21, Bob Murphy and other Park Service representatives met with Spring Meadows, Inc. specifically concerning the Devil's Hole pump. Because of widely divergent philosophies of the two groups, no agreement was reached. However, Spring Meadows, Inc. indicated its intent to bring the matter before higher authority within the Department of Interior. Nothing further has been heard in this matter.

   Spring Meadows, Inc. apparently is in the process of trying to acquire additional acreage near Devil's Hole. This would tend to strengthen their argument to utilize the existing well and to develop others. Under the circumstances, it would seem appropriate to express individual opinions to the Secretary of Interior indicating concern over the problem and urging his denial of any requests for further development of the area unless it can be conclusively proven that such development will in no way adversely affect the natural resource either at Devil's Hole or within Death Valley itself.



3. Bob Miller and Tina Nappe have been doing an excellent job in communicating with legislators and other influential people and organizations.

4. Bob Miller's summary report to the National Park Service is especially appreciated in view of the difficulties involved in producing this report within such a short time following the close of the symposium.

5. Following the symposium, Boyd Walker sent suckers and chubs taken from the upper Owens River drainage to Carl Hubbs for identification. These were identified as *Catostomus fumeiventris* (MS) and *Gila Snyderi* (MS). If the specimens identified by Dr. Hubbs (which were taken from below Crowley Lake dam) are the same as those existing in Crowley Lake and the Owens River drainage above, they are in sufficient numbers to remove any concern relative to their general abundance. Additional collections have been made and will soon be forwarded to Dr. Miller for identification.

6. Within a few days following the meeting, Sterling Bunnell acquired $1,000.00 to finance the sanc-

tuary at BLM Spring on the east side of Fish Slough. A cooperative agreement between BLM and California Fish and Game is now being drafted to allow construction during the early summer of 1970.

7. Considerable interest in *Cyprinodon* among the general public has resulted from our symposium. This has been evident from a variety of newspaper articles. Martin Litton's article in the November, 1969 "Sunset" has been of immense value in this respect, and we may expect similar response from an article on Death Valley appearing in the January, 1970 "National Geographic".

8. On December 18 Jim St. Amant and Leonard Fisk transferred 150 *Gila Mohavensis* from Zzyzx Spring to Piute Springs, San Bernardino County. Additional investigations were made at One Hole and Two Hole springs, San Bernardino County, to determine their suitability as stocking sites for endangered species. Another transplant of *Gila mohavensis* was made on January 27, when 147 individuals were introduced into a pond located at the Los Angeles County Botanic Garden.

9. In December, Jim Deacon made collections of *Cyprinodon* in small, isolated warm springs near Tecopa Hot Springs and forwarded them to Bob Miller for identification.

10. Sterling Bunnell has arranged for the February, 1970 issue of "Cry California" to be devoted to publicity on the *Cyprinodon* problem.

11. Many new fields have been prepared and new pumps installed in Ash Meadows since the November, 1969 symposium. In correspondence



dated February 16, 1970, Pete Sanchez informed us that an earth fill dam over one-half mile long is being completed northeast of Point of Rocks Spring.

## SELECTED REFERENCES RELATING TO THE DEATH VALLEY SYMPOSIUM

California Department of Water Resources

1964. Ground water occurrence and quality, Lahontan region. June, 1964, DWR Bulletin No. 106.1. State Printing Office, Sacramento.

Miller, Robert Rush

1967. Status of populations of native fishes of the Death Valley system in California and Nevada. Completion report of resource studies problem undertaken for the U.S. National Park Service, June-July, 1967. University of Michigan, Ann Arbor, August 4, 1967.

1969. Symposium on rare and endangered fishes of the Death Valley system. Summary report to the National Park Service. Museum of Zoology, The University of Michigan, Ann Arbor, December 1, 1969.

Worts, G. F., Jr.

1963. Effect of ground-water development on the pool level in Devil's Hole, Death Valley National Monument, Nye County, Nevada. Report prepared at the request of the National Park Service. U.S. Department of the Interior, Geological Survey, Water Resources Division, Carson City, Nevada, August, 1963.

# THOSE IN ATTENDANCE AT RARE FISH SYMPOSIUM, FURNACE CREEK, Nov. 18-19, 1969

| NAME | AGENCY | ADDRESS |
|---|---|---|
| Ed Smith | BLM | 2800 Cottage Way, Sacramento 95825 |
| Jim Blaisdell | NPS | 450 Golden Gate Ave., S.F. 94102 |
| Homer P. Leach | NPS | Death Valley, Calif. 92328 |
| Lewis H. Myers | BLM | Las Vegas |
| Don Cain | BLM | Ely, Nevada |
| Bill Templeton | BLM | Riverside, Calif. |
| Bob Jennings | BLM | Bakersfield, Calif. |
| Robert Rush Miller | Univ. of Michigan | Ann Arbor, Mich. |
| Frances H. Miller | Univ. of Michigan | Ann Arbor, Mich. |
| Frances N. Clark | | San Pedro, Calif. |
| O. L. Wallis | NPS | Washington, D.C. |
| Laura S. Hubbs | Scripps Inst. | La Jolla, Calif. |
| Robert L. Borovicka | BLM | 710 N.E. Holladay St., Portland, Ore. |
| Martin Litton | | 180 Bear Gulch, Portola Valley, Calif. 94025 |
| Keith R. Artz | The Nature Conservancy | 134 Madrone Ave., San Anselmo, Calif. |
| Sterling Bunnell | The Nature Conservancy | 32 Millwood, Mill Valley, Calif. 94941 |
| Paul Fodor | NPS | Death Valley, Calif. |
| James LaBounty | Bureau of Reclamation | 2565 Van Patten #2, Las Vegas, Nev. 89109 |
| Dale U. Lockard | Nevada Fish and Game | P.O. Box 4336, Las Vegas, Nevada 89106 |
| William J. Newman | Nev. Div. Water Resources | 201 S. Fall St., Carson City |
| Wayne P. Alley | Calif. State College at Los Angeles | 5151 State College Drive, Los Angeles 90032 |
| Clinton H. Lostetter | BSFW | Portland, Oregon |
| David W. Greenfield | Calif. State College | Fullerton |
| James E. Deacon | Univ. Nev., Las Vegas Dept. Biol. Science | Las Vegas, Nev. 89109 |
| W. L. Minckley | Ariz. State Univ. | Tempe, Arizona 85281 |



| | | |
|---|---|---|
| Ward Gillilan | Calif. Fish and Game | 107 S. Broadway, Los Angeles 90012 |
| Vern Burandt | Calif. F. & G. Warden | 647 Inyo St., Lone Pine, Calif. |
| Carl L. Hubbs | Scripps Inst. Oceanography | La Jolla, Calif. |
| Jim St. Amant | Calif. Fish and Game | 107 S. Broadway, Los Angeles 90012 |
| Leonard Fisk | Calif. Fish and Game | 1416 - 9th St., Sacramento 95814 |
| William M. Richardson | Calif. Fish and Game | 107 S. Broadway, Los Angeles 90012 |
| Phil Pister | Calif. Fish and Game | 407 W. Line St., Bishop 93514 |
| Robert Brown | UCLA | 3291 Sepulveda #3, Los Angeles 90034 |
| Vladimir Walters | UCLA | Dept. Zoology, UCLA, Los Angeles 90024 |
| Tom Jenkins | Bureau Sport Fisheries and Wildlife | Bishop, Calif., Rt. 3, Box 198 |
| Robert Liu | UCLA | Dept. Pathology, UCLA, Los Angeles 90024 |
| Tim Nappe | Foresta Inst. | Box 620, Rt. 1, Carson |

**15. Defendant's 1972 Exhibit K, Agenda and Minutes of Las Vegas District Advisory Board Meeting, May 24, 1967.**

AGENDA

Las Vegas District Advisory Board Meeting
May 24, 1967

| | | | |
|---|---|---|---|
| 1. | *Meeting Called to Order* | | 9:00 a.m. |
| | A. Announcement and Introduction of Guests | | |
| | B. Approval of Minutes of Previous Meeting | | |
| 2. | *Old Business* | | |
| 3. | *New Business* | | |
| | A. Ash Meadows Exchange | Stan Shepard | 9:20 a.m. |
| | B. Lincoln County Classification | Malcolm Charlton | 9:30 a.m. |
| | C. *Section 4 Permits:* | | |
| | 1. Caliente Resource Area | Malcolm Charlton | 9:45 a.m. |
| | 2. State Line Resource Area | Jim Moorhouse | 10:00 a.m. |
| | D. *Transfer of Grazing Privileges:* | | |
| | 1. Caliente Resource Area | Malcolm Charlton | 10:15 a.m. |
| | 2. Caliente Resc ce Area | Robert Currier | 10:20 a.m. |
| | E. *Adjudication of Clover Mountain Unit* | | 10:30 a.m. |
| | 1. Willow Creek Allotment | Philip Zeig | |
| | 2. Pennsylvania Allotment | Philip Zeig | |
| | 3. Henrie Brothers | Robert Currier | |
| | 4. Esplin-Lytle Allotment | Philip Zeig | |
| | 5. Lancaster Allotment | Robert Currier | |
| | 6. Amaru Allotment | Robert Currier | |
| | 7. Culverwell-Lancaster Allotment | Robert Currier | |
| | 8. Ballow-Tennille Allotment | Robert Currier | |
| | 9. Barclay Allotment | Malcolm Charlton | |
| | 10. Bradshaw Allotment | Philip Zeig | |
| | 11. Schlarman Allotment | Robert Currier (Delamar Unit) | |
| | F. Recommendation on Replacement for Cattle Representative in Precinct No. 1. | | |
| | G. Any Other Business That Should Be Brought Before the Board. | | |



United States
Department of the Interior
Bureau of Land Management
1859 North Decatur Blvd.
Las Vegas, Nevada 89108

Minutes of
Las Vegas District Advisory Board Meeting
May 24, 1967

The Las Vegas District Advisory Board convened at 3:00 p.m., May 24, 1967, at the Las Vegas BLM Office. Attending were:

*Advisory Board Members*

Emery K. Conaway, Chairman
Andrew Lytle, Vice-Chairman
Archie Hughes
John Donaldson, Wildlife Representative

*BLM Personnel*

Ross Ferris, Range Specialist, NSO
Dennis E. Hess, District Manager
Gene Nodine, Range Manager
Malcolm Charlton, Area Manager,
Caliente and Virgin Valley Resource Areas
Philip Zieg, Range Conservationist
Robert E. Currier, Range Conservationist

The meeting was called to order by Chairman Emery Conaway with a quorum of 4 representing the Board.

The primary purpose of this meeting was to discuss with the Board and obtain a recommendation on the grazing adjustment of the Clover Mountain Unit in the Las Vegas District. A copy of the agenda is attached.

The minutes of the December 16, 1966 meeting had been approved by the chairman and distributed to each

Board member for review. In view of this, the motion was made, seconded, and passed unanimously by the Board that we dispense with the reading of the minutes.

*Ash Meadows Exchange*

Mr. Stan Shepard presented the Spring Meadows, Inc. Exchange applications to the Board for their general information and comment although the lands involved are under Section 15 leases and lie outside the Grazing District. He stated that the eight applications for exchange involve lands in Humboldt County for lands in Ash Meadows in Nye County. He said that the Bureau is presently examining the lands to determine who and what is out there and the land appraisal itself. He stated that the BLM wants to expose exchanges involving large acreages to as many interested parties as they can. The lands in Ash Meadows are in a Type IV transfer area.

Spring Meadows, Inc. has purchased some 5,000 acres of deeded land from George Swink, and with this additional land could develop the area for agricultural, livestock, and residential homesite uses. They hope to encourage the workers at Mercury to live in Ash Meadows. About 60% of the area is covered with unpatented mining claims.

Mr. Shepard stated that 80% of the land has been examined and he hopes to finish the field work this week.

Q. How many acres are involved?

A. About 13,500 acres of public domain land is involved in Ash Meadows and a similar amount of private land in Humboldt County. These private lands intermingle public domain and their acquisition will provide better management for the Winnemucca District of BLM for livestock and recreation. Several range users will utilize these lands on a cooperative range basis.



Q. What provisions are to be made to protect the springs in Ash Meadows and the rare fish?

A. Our proposed classification notice will be mailed to all the interested groups we can think of for their comments or protests.

Q. Are there springs on public domain land?

A. Jackrabbit Springs in the only large one left, and it is not involved.

Mr. Donaldson stated that the Nevada Fish and Game Commission has a cooperative agreement with the University for the preservation of rare and endangered fish.

Mr. Shepard said that Nevada Southern University and the Nevada Fish and Game Commission would certainly receive notice of the proposed classification for their comments.

*Lida Townsite*

Mr. Shepard went on to explain the disposal of lands around Lida Townsite. The Bureau has been asked to put the lands up for sale under the 1964 Public Sale Act.

*Lincoln County Classification*

Mr. Malcolm Charlton presented the proposed Lincoln County Classification to the Board for their comment and recommendation. The lands included in the classification were pointed out on a map. Mr. Charlton stated that the BLM is authorized by P. L. 607 and instructed to classify the public lands. Most all public lands in Lincoln County have been proposed for classification by the Las Vegas and Ely Districts. BLM

personnel have met with the public in Pioche, Panaca, Caliente, and Alamo, and have presented the proposal and asked for suggestions. All lands identified as having potential for disposal have been excluded from the proposed classification. All other public lands having potential for multiple-use management have been proposed for retention. One member of the Board stated that there was not much opposition to the proposed classification at the public meetings and hearings.

The motion was made, seconded, and passed unanimously that the Board was in favor of the proposed classification (Serial No. N-892) of the public domain lands in Lincoln County of the Las Vegas District as published in the Federal Register.

*Section 4 Permits*

The Section 4 Permits submitted since the last meeting in the Caliente and Virgin Valley Resource Areas were presented to the Board by Malcolm Charlton.

Those permits that had not been previously approved by the Board were:

| | |
|---|---|
| Rachel Ballow | — Corral and Loading Chute |
| Foremaster Bros. | — Cement and Galvanized Iron Tank and Water Haul |
| Foremaster Bros. | — Corral and Loading Chute |
| Erwin Burns | — Southeastern Corral |

| NAME | AGENCY | ADDRESS |
|---|---|---|
| Jim Yoakum | BLM | 300 Booth St., Reno, Nevada |
| Peter G. Sanchez | NPS | Death Valley, Calif. |
| Alan M. McCready | Private | 2510 Rogue River Drive, Sacramento |
| Jim Brown | UCLA | Dept. Zoology, UCLA, Los Angeles 90024 |
| Mrs. Jim Brown | UCLA | Dept. Zoology, UCLA, Los Angeles 90024 |
| Robert Murphy | NPS | Death Valley, Calif. 92328 |
| David Soltz | UCLA | Dept. Zoology, UCLA, Los Angeles 90024 |



**16. Presidential Proclamation of January 17, 1952, 17 Fed. Reg. 691 (Not Printed; See Pet. App. #74-1107, pp. C1-C3).**

**17. Order, C.A.9, August 20, 1973, Modifying Preliminary Injunction.**

United States Court of Appeals, for the Ninth Circuit.

(Caption omitted in printing)

ORDER [August 20, 1973]

Before: CHAMBERS and WALLACE, Circuit Judges, and SCHWARTZ, District Judge.

PER CURIAM:

This court is of the view that the preliminary injunction issued in the district court should be modified there to provide that the pumping of defendants be restricted to the extent necessary to maintain the water level of Devil's Hole at its level existing as of the date of the filing of this order; that is, as best the actual level as of this date can be ascertained; or at the level existing on August 7, 1973, whichever is higher.

This more nearly serves to preserve the status quo than the temporary injunction granted in District Court.

We regard the circumstance that there is apparently no recourse to defendants-appellants for damages (if the preliminary injunction was improvidently issued) as a strong equity to weigh in the balance for the defendants.

Further, on our present record there is little reason to believe that the present order we now direct will result in the extinction as a species of the pupfish in Devil's Hole.

Further, we make this comment: We see no reason that the government should not have here now sought to get this case to trial on the merits and a final decree entered. It is doubtful if there is much more evidence to be presented. And it is not right for the government to prolong the entire litigation one day longer than is necessary.

Our decision is effective immediately as a judgment and mandate.

If the government can represent that it can and would legally indemnify the defendants against loss if it eventually develops that the original temporary injunction was improvidently issued, the court as now constituted would be willing to entertain a motion to reconsider this order.

Remanded for proceedings consistent herewith.

**18. Order, C.A.9, January 24, 1974, Remanding Cause for Entry of Final Decree.**

United States Court of Appeals, for the Ninth Circuit.

(Caption omitted in printing)

ORDER

Before: CARTER and CHOY, Circuit Judges, and SOLOMON, District Judge.

At the argument the court suggested the desirability of a final judgment. As we recall, the United States and the State of Nevada stipulated at the argument that the preliminary injunction might be considered, for the purposes of the appeal, a final judgment. The appellants, Francis Leo Cappaert, Marilyn I. Cappaert, B. L. Barnett and Spring Meadows Ranch, have advised the court by letter that they also stipulate to the same effect.



The court is of the view that the matter should be presented to the district court for a determination of whether the district court desires to make any change in the preliminary injunction; that a formal order be filed and entered to the effect that the preliminary injunction (as it now stands or as amended) be incorporated in the order as a permanent injunction, or a new permanent injunction be filed and entered; that new notices of appeal be filed from the permanent injunction; and that the parties stipulate that the present record in Nos. 73-2168 and 73-2915 be part of the new record on appeal.

The court will then consider the new appeal on the old record, without further briefs or argument, and render a decision in the matter.

**19. District Court's Findings of Fact and Conclusions of Law, April 9, 1974.**

In the United States District Court, for the District of Nevada.

(Caption omitted in printing)

FINDINGS OF FACT AND CONCLUSIONS OF LAW

*Introduction*

This is a civil action in which the United States as plaintiff has sought to have its rights declared to the use of so much of the waters appurtenant to the land known as Devil's Hole, Death Valley National Monument, as may be necessary for the needs and purposes of maintaining the pool and the desert pupfish therein, and that such rights be declared to have a priority date of January 23, 1952. The United States also has sought both a preliminary and a permanent injunction enjoining

the defendants Francis Leo Cappaert, Marilyn I. Cappaert, B. L. Barnett, and Spring Meadows Ranch, and each of them, from pumping wells known as Nos. 1, 2, 3, 4, 5, 6, and 16 and 17, and from all other wells now existing or hereafter drilled on designated sections of land,[1] except for domestic purposes, which would be similarly detrimental to the water rights of the United States and the survival of the Devil's Hole pupfish. On June 5, 1973, this Court made its findings of fact and stated its conclusions of law, issued its preliminary injunction, and appointed a Special Master.

On appeal, the Court of Appeals made an order that this Court enter its final decree.

At a conference with this Court on February 15, 1974, counsel for all parties advised that they had no further evidence to offer and agreed that a final decree should be entered.

*Findings of Fact*

1. Plaintiff is the United States of America and the jurisdiction of the Court was invoked under Title 28, Section 1345, United States Code.

2. Spring Meadows, Inc., was a corporation formed under the laws of the State of Nevada on June 17, 1966, with 60 Court Street, Reno, Nevada, listed as its place of business. Spring Meadows, Inc., filed a Certificate of Voluntary Dissolution with the Secretary of

[1]Wells Nos. 1, 2, 3, 4, and 5 are located in Section 7, T. 18 S., R. 51 E.; Well No. 6 is located in Section 3, T. 18 S., R. 50 E.; Wells Nos. 16 (1A) and 17 (1B) are located in Section 8, T. 18 S., R. 51 E. All other wells now existing or hereafter drilled within Sections 28, 33 and 34, T. 17 S., R. 50 E.; within Sections 31 and 32, T. 17 S., R. 51 E.; within Sections 2, 3, 4, 9, 10, 11, 12, 13, 14 and 15, T. 18 S., R. 50 E.; and within Sections 5, 6, 7, 8, 17 and 18, T. 18 S., R. 51 E., M.D.B.M.



State for the State of Nevada on December 30, 1970. The only stockholders at the time of the filing of the Certificate of Voluntary Dissolution were Francis Leo Cappaert and Marilyn I. Cappaert of Vicksburg, Mississippi.

3. A stipulation for amendment of parties was filed with the Court and approved under which the defendants Francis Leo Cappaert and Marilyn I. Cappaert stipulated that they had actual notice of this lawsuit, had been properly served and subjected themselves to the jurisdiction of the United States District Court for the District of Nevada.

4. Spring Meadows Ranch is the land owned by Francis Leo Cappaert and Marilyn I. Cappaert located near Lathrop Wells, in the County of Nye, State of Nevada. Spring Meadows Ranch is a cattle ranch consisting of approximately 12,000 acres, of which 4,000 acres are in cultivation. Approximately 1,700 to 1,800 head of cattle are fed on the ranch at any given time.

5. Defendant B. L. Barnett is ranch manager of the Spring Meadows Ranch.

6. The United States is the owner of Devil's Hole, Death Valley National Monument, and has been at all times since the Treaty of Guadalupe Hidalgo in 1848.

7. Devil's Hole, a 40-acre tract, was withdrawn from the public domain and became part of Death Valley National Monument by Presidential Proclamation 2961, of January 17, 1952. The Presidential Proclamation was published in the Federal Register on January 23, 1952 (17 Fed. Reg. 691).

8. Devil's Hole is a limestone cavern which lies approximately 50 feet below the general land surface, with sheer walls on all but its western side. At the

bottom is a pool of water which is the home of the Devil's Hole pupfish, Cyprinodon diabolis. The pool is about 65 feet long and 8 to 10 feet wide, with a natural rock shelf at the western edge. This natural shelf slopes to the east, is 6 to 17 feet in length, and varies in width from 4 to 9 feet.

9. Through the Presidential Proclamation of January 17, 1952, and its publication in the Federal Register on January 23, 1952 (17 Fed. Reg. 691), the unappropriated waters in, on, under and appurtenant to Devil's Hole were withdrawn from private appropriation as against the United States and reserved to the extent necessary for the requirements and purposes of the said reservation.

The purposes of the reservation of Devil's Hole as part of Death Valley National Monument include the preservation of the pool of water and the preservation of the Devil's Hole pupfish (Cyprinodon diabolis) which live therein.

10. The defendants own lands and claim water rights within the Ash Meadows area of Nye County near Devil's Hole and claim rights in or to waters of that area, which claimed rights conflict with the claimed rights of the United States.

11. In June 1962, a copper washer was placed on the wall of Devil's Hole by the United States Geological Survey to serve as a reference point for its water level.

12. The Devil's Hole pupfish is dependent for feeding and reproduction and, hence, for its survival upon the natural rock shelf. This rock shelf is just below the surface of the water in Devil's hole.

13. Prior to the defendants' groundwater pumping in the Ash Meadows area, the mean water level in



Devil's Hole was 1.2 feet below the copper washer and had not been lower than 1.59 feet below the copper washer.

14. The natural rock shelf and rubble thereon on which the Devil's Hole pupfish depend for feeding, reproduction and, hence, their survival, is nearly 100% covered with water when there is a mean water level of 3.0 feet below the copper washer.

15. The defendants drilled wells and began heavy pumping of groundwater in the summer of 1968. Since then the defendants have engaged in heavy groundwater pumping each year.

16. The defendants' pumping of groundwater from wells known as Nos. 1, 2, 3, 4, 5 and 6, and 16 and 17, has drawn water from the springs and underground sources which comprise the supply for Devil's Hole. Because the defendants' wells and Devil's Hole are hydraulically connected, defendants' pumping has caused the water level in Devil's Hole to drop.

17. In 1969 the water level in Devil's Hole reached a low of minus 2.3 feet below the copper washer.

18. In 1970 the water level in Devil's Hole reached a low of minus 3.17 feet below the copper washer.

19. In 1971 the water level in Devil's Hole reached a low of minus 3.48 feet below the copper washer.

20. In 1972 the water level in Devil's Hole reached a low of minus 3.93 feet below the copper washer.

21. If the defendants had pumped water from their wells in 1973 that was comparable or greater in amount than that pumped in 1972, the water level in Devil's Hole would probably have reached a low of more than minus 4.2 feet below the copper washer.

22. Since the source of water supplying both Devil's Hole and the groundwater tapped by the defendants' wells on Spring Meadows Ranch is the same, future wells in other areas of the ranch may have an adverse effect on the water level in Devil's Hole. Pumping from certain areas of the ranch, notably Sections 28, 33 and 34, T. 17 S., R. 50 E., Sections 31 and 32, T. 17 S., R. 51 E., Sections 2, 3 and 4, and 9, 10, 11, 12, 13, 14 and 15, T. 18 S., R. 50 E., and Sections 5, 6, 7 and 8, and 17 and 18, T. 18 S., R. 51 E., were shown to have a probable effect on the water level of Devil's Hole.

23. At the hearing held on June 2, 1973, counsel stipulated that:

(a) In September 1972 the water level in Devil's Hole ceased to drop at a level of about 3.7 feet below the level of the copper washer reference point.

(b) Throughout September, October and the early part of November 1972, the water level remained stabilized at about 3.7 feet below the copper washer reference point, during which time the production of water from the defendants' wells, as estimated from electrical power records, was about 700 acre feet per month, plus or minus 10%.

(c) The water level in Devil's Hole arose to the same position during the winter of 1972-73 as occurred during the winter of 1971-73, that being 2.65 feet below the copper water reference point.

(d) The pumpage from the aquifer system in the Ash Meadows area can be regulated so as to produce stabilization of the water level in Devil's Hole at any desired position below its mean natural level of 1.2 feet below the copper washer.



(e) On May 30, 1973, the daily mean water level at Devil's Hole was 3.41 feet below the copper washer.[2]

24. In order to maintain a viable continuous population of Devil's Hole pupfish, the water level in Devil's Hole must be maintained above the natural rock shelf and the rubble thereon, which is a minimum of not less than a daily mean of 3.0 feet below the copper washer.

25. If the water level at Devil's Hole drops below 3.0 feet below the copper washer, the survival of the Devil's Hole pupfish will be threatened, that is, the time of their becoming extinct in the natural evolutionary order will be accelerated.

26. The use of an artificial shelf in Devil's Hole has not proven to be a successful alternative course of action for the preservation of the Devil's Hole pupfish.

27. Transplanting of the Devil's Hole pupfish has not to date proven to be a successful alternative course of action for the preservation of the Devil's Hole pupfish.

28. The United States has shown that the public interest lies in the preservation of this endangered species. Congress has enacted the Endangered Species Conservation Act (16 U.S.C. 668aa.), and the Secretary of the Interior pursuant to that statute has identified the Devil's Hole pupfish, Cyprinodon diabolis, to be an endangered species. Witnesses offered by the United States testified to the importance of the species to

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[2]For a comprehensive and chronological record of the daily mean water level from June 15, 1973, through March 3, 1974, inclusive, see the reports of the Special Master on file in this action. The first report was dated July 5, 1973, the ninth report March 19, 1974. Although this Court makes no findings relative to the Special Master's reports, it is believed that all counsel will concede the accuracy of the Special Master's findings as to the daily mean water level history found in the reports.

mankind. Congress, state legislatures, local governments, and citizens have all recently voiced their expression for the preservation of our environment, and the destruction of the Devil's Hole pupfish would go clearly against that theme of environmental responsibility.

29. In support of its prayer for a permanent injunction, the United States has shown that the pumping by the defendants from certain wells on the Spring Meadows Ranch lowers the water level in the pool in Devil's Hole in derogation of the prior rights of the United States to the use of the waters appurtenant to Devil's Hole for the preservation and maintenance of Devil's Hole and the Devil's Hole pupfish found therein.

30. If a permanent injunction is not granted restricting pumping by the defendants as prayed for on the Spring Meadows Ranch, there is grave danger that the Devil's Hole pupfish may be destroyed, resulting in irreparable injury to the United States.

31. Although the defendants have shown that they would suffer economic injury from the restrictions on their pumping prayed for by the plaintiff United States, there was been no request from the Government to completely prevent the use of any water by the defendants. The restriction prayed for was curtailment of the pumping only to the extent necessary to provide for the continued survival of the pupfish. In addition, so far all the wells identified as affecting Devil's Hole lie within two and one-half miles of Devil's Hole.

*Conclusions of Law*

1. This Court has jurisdiction of the subject matter and of the parties to this action.

2. Through the Presidential Proclamation of January 17, 1952, and its publication in the Federal Register on January 23, 1952 (17 Fed. Reg. 691), the unappropriated waters in, on, under and appurtenant to Devils' Hole were withdrawn from private appropriation as against the United States and reserved to the extent necessary for the requirements and purposes of the said reservation.



3. The purposes of the reservation of Devil's Hole as part of Death Valley National Monument includes the preservation of the pool of water and the preservation of the Devil's Hole pupfish (Cyprinodon diabolis) which live therein.

4. Congress, through the Desert Land Act of 1877, 19 Stat. 377, and its predecessor acts of July 26, 1886, and July 9, 1870, 43 U.S.C. 321, separated the public domain's water rights from its land rights.

5. The patents to which the defendants trace their ownership passed title to land, but not to any water rights.

6. The exchange of lands between the United States and the defendants in 1969 likewise did not pass any title to water rights.

7. Because of the federal reservation of January 1952, and because the defendants have not shown this Court any water rights established prior to the federal reservation, the water rights of the plaintiff United States are superior in time and right to those of the defendants.

8. The behavior of the United States and the defendants in the land exchange, or in any other dealings, does not make out a case of estoppel against the United States.

9. The United States has shown that the public interest lies in the preservation of this endangered

species. Congress has enacted the Endangered Species Conservation Act (16 U.S.C. 668aa.), and the Secretary of the Interior pursuant to that statute has identified the Devil's Hole pupfish, Cyprinodon diabolis, to be an endangered species. Witnesses offered by the United States testified to the importance of the species to mankind. Congress, state legislatures, local governments, and citizens have all recently voiced their expression for the preservation of our environment, and the destruction of the Devil's Hole pupfish would go clearly against that theme of environmental responsibility.

10. The United States has no adequate remedy at law in the event the pupfish are rendered extinct by the action of the defendants in pumping ground water on the Spring Meadows Ranch.

11. The United States has shown that it is entitled to a permanent injunction limiting the amounts of groundwater pumping from wells Nos. 1, 2, 3, 4, 5, 6, and 16 and 17, and limiting any future withdrawals from Sections 28, 33 and 34, T. 17 S., R. 50 E., Sections 31 and 32, T. 17 S., R. 51 E., Sections 2, 3 and 4 and 9, 10, 11, 12, 13, 14, and 15, T. 18 S., R. 50 E., and Sections 5, 6, 7 and 8, and 17 and 18, T. 18 S., R. 51 E., so that the water level in Devil's Hole does not drop below a daily mean water level of 3.0 feet below the copper washer.

DATED: April 9th, 1974.

ROGER D. FOLEY
DISTRICT JUDGE



**20. District Court's Final Decree, April 9, 1974 (Not Printed; See Pet. App. No. 74-1304, pp. xix-xxii).**

**21. Order, C.A.9, May 10, 1974, Staying Final Decree of District Court.**

United States Court of Appeals for the Ninth Circuit.

(Caption omitted in printing)

Before: MERRILL and BROWNING, Circuit Judges

ORDER

On consideration of appellants' motion for modification of final decree pending appeal, it is ordered that the decree of the district court, insofar as it is inconsistent with the order of this court entered August 20, 1973 in case No. 73-2168, is stayed pending further order of this court. Appellants' motion for modification is passed to a regular motions panel of this court.

/s/ Charles M. Merrill
/s/ James R. Browning
U.S. Circuit Judges

**22. Order, C.A.9, May 29, 1974, Modifying Final Decree of District Court Pending Appeal.**

United States Court of Appeals, for the Ninth Circuit.

(Caption omitted in printing)

ORDER

BEFORE: CARTER and CHOY, Circuit Judges and *SOLOMON, District Judge.

Pending final determination of the above appeal, the final injunction is modified to require that the water

*The Honorable Gus J. Solomon, Senior U.S. District Judge, District of Oregon, sitting by designation.

level in Devil's Hole be maintained at not less that 3.3 feet below the marker.

The foregoing order is entered pursuant to the direction of Circuit Judge James M. Carter, for himself and Judge Solomon.

**23. Opinion, C.A.9, Dec. 4, 1974 (Not Printed; See Pet. App. No. 74-1107, pp. A1-A7; Also in Pet. App. No. 74-1304, pp. i-xviii).**

**24. Judgment of Affirmance, C.A.9, (Not Printed; See Pet. App. No. 74-1107, p. B1; Also in Pet. No. 74-1304, pp. xxii-xxiii).**

**25. Order Denying Rehearing, C.A.9, (Not Printed; See Pet. App. No. 74-1107, p. B2; Also in Pet. App. No. 74-1304, pp. xxiii-xxiv).**